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Teaching of Therapeutics*

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For years medical schools have struggled with the curriculum in an attempt to give the student a thorough grounding in therapeutics. The fact that teaching methods vary widely suggests strongly that there may still be room for improvement.

It is not always appreciated that all clinical departments devote considerable time to instruction in treatment. An estimate of the proportion of teaching time devoted to treatment in various clinical departments of the New York University College of Medicine is as follows:

In the major courses:

Medicine	40%
Surgery	20%
Gynecology	40%
Obstetrics	90%
Pediatrics	50%

In the specialties:

Psychiatry	50%
Neurology	20%
Oto-Rhino-Laryngology	80%
Dermatology	20%
Orthopedic Surgery	20%

It is evident, then, that a fairly large proportion of the teaching time in clinical departments is devoted to the treatment of disease, refuting the common complaint that so much time is alloted to diagnosis that therapeutics is neglected.

In spite of this, however, interns when questioned about the weaknesses in their medical college work, will in most cases say that they have had inadequate training in therapeutics. Their frequent failures in work-

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ing out relatively simple therapeutic problems would indicate that this may be true, as was pointed out by Boyd[1] about five years ago.

The survey the New York Committee on Internships and Residencies is making in New York City indicates, from incomplete data available so far, that interns generally consider their medical college preparation in therapeutics insufficient to enable them to give proper treatment to patients. This criticism was not confined to the graduates of any particular medical college. It would seem, at first sight, that this is a rather serious indictment of modern medical education. However, when our recent graduates are questioned more closely they admit that they have had satisfactory training in the treatment of specific diseases. There is no hesitation, for instance, as to the proper method of giving liver in pernicious anemia; the dose of antitoxin in diphtheria; how to administer digitalis in congestive heart failure. When confronted with a specific disease for which there is a definite form of treatment they seem adequately prepared. Why then are they ill at ease and uncertain?

Let us consider what defects in their undergraduate medical work may, perhaps, have been responsible, by an examination of current teaching methods. We may take it for granted that therapy of definite diseases is well taught in most medical colleges. How well taught are the general principles from which the student can plan the treatment in a particular case? Is enough time devoted to instruction in rational symptomatic treatment? Is there adequate instruction in the general management of the patient so that he is made comfortable? Is the didactic work followed up by sufficient practical work on actual cases? These are questions which each medical faculty must ask itself whenever revisions in the teaching of therapeutics are necessary. In order to find out how the medical colleges in North America have attempted to solve this very difficult problem the description of courses in the catalogs was consulted.

Considerable variations in teaching methods were noted, but, in general, it was found that there were four main types.

(1) Therapy is taught in each clinical department with or following the teaching of diagnosis. No courses in general principles are given.

(2) A separate department of therapeutics teaches general principles, gives demonstrations, conducts clinics, etc.

(3) The department of pharmacology teaches or controls the teaching of general principles of therapeutics in the clinical years.

(4) The department of medicine has a subdepartment which controls the teaching of general principles of therapy.

1. Boyd, L. J.: Teaching of Therapeutics, J. Assoc. Amer. Med. Colls., 5:35, January, 1930.

The advantage of the first type lies in the close correlation of teaching in diagnosis and treatment. The same teacher is responsible for both. However, there are three main objections to this method: First, responsibility for teaching fundamental principles does not exist and, consequently, they may not be taught at all, or they may be taught in a fragmentary and uncoordinated manner much to the confusion of the student. Secondly, too little time is apt to be allowed for symptomatic, palliative and supportive treatment. What is taught will be chiefly therapy of specific diseases. Thirdly, there is a great chance that the student will develop the wrong point of view on treatment. In this form of teaching, they tend to memorize the detailed treatment of each disease rather than learn to plan from basic principles and treat the patient. Such tendencies are bad. Students should be taught to think even in therapeutics.

The second type, where there is a separate department of therapeutics, would seem to answer the objections raised to the first method. It does permit of a well coordinated course in general principles of therapy. A place is here provided for such subjects as physical therapy, nursing procedures, etc. In a few medical colleges where such separate departments exist they seem to be functioning fairly well. The chief objection is that this set-up tends to make treatment something apart from diagnosis. The student will look for instruction in diagnosis to the clinical departments and for instruction in treatment in this department. The teacher of therapeutics in a separate department will probably not have the knowledge or the necessary preparation to fit him for teaching all types of therapy. There is a tendency, then, to put the emphasis on subjects in which he has had special training. This will eventually lead to conflict with one of the clinical departments as its teaching of treatment is encroached upon. It is interesting to note that only a few medical colleges use this method.

In the third group, the department of pharmacology is responsible for the teaching of basic principles of therapy in the clinical years. The great advantage of this method over the other three methods is that the sharp transition between preclinical and clinical work is avoided. The student easily recognizes the importance of his basic scientific training in the treatment of disease. However, there is a tendency to overemphasize drug therapy. Where an attempt is made to rectify this, we are apt to find such incongruities as the professor of pharmacology lecturing on physical therapy and other subjects wholly unrelated to his training. Such proceedures must, in a certain measure, disrupt the regular work of the department of pharmacology and impair its efficiency. Again, it is not usual to find teachers who are capable pharmacologists and at the same

time have sufficient clinical experience to enable them to instruct the student adequately in therapeutics.

The fourth method makes the department of medicine responsible for the teaching of general principles of therapy. It seems rational that this is the clinical department that should assume the responsibility for teaching the students principles and practice in the general care of a patient. A number of medical colleges are using this method. Yesterday Dr. Graham outlined how this particular method is so admirably suitable to the training of the student in the University of Toronto.

In 1932 we were forced to make a decision as to which of the methods of teaching therapeutics we would utilize by the endowment of a chair in therapeutics. After careful consideration, it was decided to make a subdepartment of therapeutics in the department of medicine, somewhat like the method described yesterday, but adapted for our own peculiar needs. A small separate budget and a laboratory were provided. The subdepartment, then, became responsible for the teaching of basic principles of therapy, the general management of patients and other types of general therapy which were not being taught or were inadequately taught in the clinical departments. Gradually, by example and persuasion, it is hoped that the principles taught under the supervision of the professor of therapeutics will be followed through in the therapeutic teaching in the clinical departments generally.

The plan of teaching is as follows:

In the third year, 30 lectures are devoted to a discussion of basic principles of treatment and management of the patient. All specific therapy relating to particular diseases is left for the clinical departments to teach. In the first lecture, the student is shown how his scientific training begun in his secondary school, through college and the pre-clinical years of medicine has led up to and prepared him for therapeutics. He is told that there are still great gaps in our knowledge. He is instructed how to evaluate therapeutic research and where to go for accurate information. It is also made clear to him that it is the patient who must be treated. In succeeding lectures, the general principles of various types of therapy such as drug therapy, psychotherapy, physical therapy, biological therapy, etc., are given either by the professor of therapeutics and by lecturers from the appropriate departments. At the end, a summing up lecture shows how these various forms of therapy are interrelated. When special lecturers are used three things are accomplished:

(1) The material is presented by some one trained in that particular branch of therapy.

(2) The lecturer learns how his subject is related to the whole problem of therapeutics.

(3) The student learns that regardless of the type of therapy the same general principles obtain.

Several lectures are also devoted to the management of patients, for instance, the general management of chronic and acute diseases, the special problem of old age, etc.

Small groups are taken for two, two-hour periods for instruction in nursing procedures by a member of the staff of instruction of the Bellevue Hospital Nurses Training School. This work is supervised by the department of therapeutics and those procedures are demonstrated which seem most important. We are conscious of the fact that the time allotted is far too short.

In the fourth year, one conference on symptomatic treatment is given to each section during their clinical clerkship in medicine. At this conference, the clinical clerks present the symptomatic treatment and management of their cases for general discussion. Also, there is a full time elective of one month in the fourth year in which the student may learn, by actual participation in the work, the methods of therapeutic research.

It is also the function of this department to acquaint itself with the teaching of treatment in the clinical departments so that it can initiate steps to provide better coordination in such teaching.

It can be seen that in the present plan the department of therapeutics bears only a small proportion of the teaching load in therapy. Rather its function is three fold:

(1) To train the student to apply his scientific knowledge and methods to therapeutics.

(2) To teach basic principles of therapy.

(3) To coordinate the teaching of treatment in the various clinical departments.

If this is accomplished, then the student will think of each patient as a therapeutic problem in the solution of which he must make use of his whole background of scientific training.

The Teaching of Pharmacology from the Standpoint of the Examiner*

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It would be difficult to discuss the teaching of any subject from the standpoint of an examination or the opinion of an examiner. Such an approach considers the process of thought acquired in a given division of understanding in an isolated, detached fashion, in terms of an end reaction, namely, an examination. Examinations and people who give them are necessary checks. They only serve their full function when they catch the significance of the type of training which individuals have received prior to the final test and through this test used as an index of acquired information attempt to ascertain in what particulars instruction in such a division of the medical curriculum has failed and in what manner it can be improved. In other words, an examiner in pharmacology is furnished the opportunity of ascertaining certain particularities of a general and specific nature as expressed by those examined and which reflect also not only the knowledge but the ideals of the individual who did the teaching. Has the student acquired a type of pharmacological information which is sound in theoretical concepts of the way in which chemical agents may influence living tissue? Does his information embrace an understanding of pharmacological action as a pure science containing an element of isolation which detaches it by its content from other related sciences and enables it to stand alone in its own right? Is there a certain justifiable amount of this information in such form and has it scientific basis enough and sufficient freedom of operation to enable it to be applied thoughtfully in aiding the recovery from disease, and, finally, are such examinations of a type which indicate whether or not a sufficient amount of information is possessed by the one examined to justify him in this particular, proceeding with his medical education. Both qualitative and quantitative measurements may be made through an examination and the greatest of these is the quality of the information which has been acquired.

Pharmacology, as has been the case with other subjects in the medical curriculum, is a product of evolution dependent on scientific information in

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spheres which were once not scientific. From the older materia medica, which embraced botany, pharmacognosy and pharmacy, a something known as pharmacology and a something unknown as therapeutics, there has arisen a science which concerns itself with the action of chemical agents on living vegetable and animal tissues which stands on its scientific foundation as pharmacology. The understanding which it holds and attempts to convey is not superficial, as it once was, being then content with statements that chemical agents and drugs influence tissue reactions in certain directions; it goes much further with analytical reasoning and attempts to explain the mechanism of this action either through intricate physical effects, chemical reactions in which the molecular constitution of the substance employed must, at least, be known or through a combination of both of these modes of action. The possibilities for research and the further evolution of this subject are as limitless as is the chemical nature of the extraneous agents and the tissues on which and through which they operate.

In the commencement of this science, from its then final nature, emphasis was placed on the ability of chemicals, drugs, to be immediately and tangibly helpful. The galenical approach to disease amelioration forgot at the outset the far more profound conception of the modification of such conditions as outlined in the wisdom of Hippocrates which was through advice and the employment of natural measures and not rather exclusively and with superficial understanding by the use of these extraneous and artificial agents. However, in the presence of disease and death and with the discovery of substances which would modify pathological processes, it was only natural for such agents to be employed in a helpful but not understanding fashion and for more fundamental and less dramatic measures to be neglected.

As a result, there rapidly accumulated a large number of remedial measures, many of which were worthless, and still are, which were employed not experimentally but practically in an unscientific manner. As faulty, however, as this method was, it gave us the commencement of the understanding of such substances as mercury in syphilis, arsenic and quinine in malaria, ipecac in dysentery, cod liver oil in states of generalized faulty nutrition and opium for rest, sleep and peace. Such beginnings have, through the introduction of the experimental method, been extended and stabilized scientifically. The use of this method of investigation has eliminated many substances of no scientific or applied value, but, unfortunately, it has through a lack of discrimination introduced others, certain of which possess the same characteristics. Experimental study of a substance, situation or circumstance, embraces not only the mechanics of

the experiment but of equal, if not of more, importance the sane interpretation and adjudication of the results obtained.

The employment of the experimental method in pharmacology has not only led to its scientific development and advancement but it has changed the teaching of the subject and modified examinations in it. Twenty-six years of teaching and examining local groups of students in this subject and more recently as a member of the Examination Committee of the National Board of Medical Examiners, in formulating questions for testing many and diversified groups, has served to emphasize the shift in the manner in which pharmacology is now taught and to raise the question as to whether or not certain changes in the teaching have not gone too far as a result of its evolution through scientific investigation. The opportunity afforded by such observations has raised the very important question as to whether or not certain teachers of this subject are not in the process of forgetting, not so much the type of student which they are teaching, but the objective which these students have which makes it necessary for them to acquire a certain type of pharmacological information.

Several years ago I had the opportunity of listening to lectures in pharmacology in two widely separated universities. It happened that the first lecturer was dealing with that group of chemical agents which decrease the activity of the central nervous system as a general influence, and certain of its centers in a particular fashion. For an hour on two successive days, I do not know for how much longer, the instructor busied himself but failed to interest his students by a discussion of the chemical aspects of the salts of barbituric acid, and from such presentations he pointed out the possibility of the production of certain salts other than those which had to date been produced. I understood that after another day of similar intriguing chemical analysis this important group of substances was dispensed with without commencing a consideration of their pharmacological action. As a lecture in theoretical organic chemistry of a restricted nature, without much vision, to a group of splendidly prepared students seeking their doctorate in organic chemistry, such a presentation might be accepted without raising any serious objection. This instructor, however, was not teaching pharmacology. He had failed entirely to appreciate the mentality, interest and objective of his students. He had not advanced them in thought but only befuddled those who were foolish enough to pay attention to him. He had failed to raise the ever fascinating question of why do these chemicals elect to influence nervous tissue and, furthermore, how do they do it. These medical students were prepared for ignorance, empirical and slipshod workmanship, and were made easy prey for the

commercial drug vendor. The exposition just recounted did not fire them with the inquisitiveness of investigating the intricacies and the beauty of the influence which certain chemical substances may have on life; not only normal life, but perverted life, which may need, in part, through their understanding of this science, aid in establishing its readjustment.

The second instructor in pharmacology whom I was privileged to hear exposed himself in a very different fashion. He completed a consideration of the digitalis bodies in one lecture. He stated with galenical reminiscence the geographical and botanical origin of these drugs and proceeded in a rather graphic manner to discuss their use in certain cardiovascular and renal maladjustments. The chemical constitution of the glucosides was not referred to, the mechanism of digitalis action on certain normal tissues and the modification of this action by pathological processes was not undertaken nor were certain particulate influences of the glucosides, as may be shown by their emetic action, discussed. He failed to see a group of complex chemical substances influencing living tissues in a largely explainable manner but only saw them empirically in terms of their superficial helpfulness. He lost an opportunity to breed a desire for particulate understanding through scientific investigation. He retrogressed pharmacology to the days of Galen.

There must be a position for an instructor between these two extremes in the teaching of this science which may be fostered and aided by an examination which expresses the ideals of a modern and balanced type of examiner. The hope has been entertained by the National Board of Medical Examiners that such an influence might be exerted by its Board. These examinations have, of necessity, as their primary function the object of ascertaining by judiciously selected questions whether or not an applicant has sufficient information of a pharmacological character to enable him to employ safely, sanely and thoroughly, not many, but a few of these agents in the treatment of abnormal functional and structural states. Such examinations have the opportunity of an even greater service to scientific medicine. They should emphasize the fundamental scientific aspects and possibilities of the subject. They are, and they should be, coming from this body, not ordinary but honors tests or examinations which will pick out and, in a measure, rate differently those who pass them. The questions composing such examinations should be of such a nature as to enable the well-trained, superior individual to assert his supremacy in understanding and to permit him to stand apart from the commonplace. Through his effort and the recognition of it, such individuals may be permitted to function as the leaven for the whole loaf.

Preparation for an examination of this type in pharmacology should have certain fairly well defined characteristics, ever modified and made attractive by the understanding and personality of the instructor. The purpose of pharmacology in the medical curriculum, not as an abstract, pure science isolated from its purposefulness, should first be formulated. It would appear that the reason for such information having a place in the medical curriculum is to acquaint certain biologically minded individuals who intend to apply such principles to organisms unable to remain stabilized as normal, information concerning the mode of action of certain selected chemical substances which may either remove the cause of their instability, rarely repair the physical defects induced by the causes, or, more frequently, modify the indications of this instability so that natural forces operating within the organism may effect a balanced, workable readjustment of tissues. The organism may have to be seen for a time and to a certain extent in terms of certain particularities in its departure from the normal, but it can only be adjusted finally by seeing it as a whole; the relationship of one part to another part and of these parts to its internal and external environment. A division of the medical curriculum with such an objective holds a sufficiency of abstract, scientific beauty and enough practicality to interest and soundly develop the student and to challenge the extent and depth of specialized information as well as the breadth of undersanding of an instructor.

In an examination of the order under consideration, pharmacy as such should not have a definite position. How galenical preparations of drugs are made and prescriptions compounded, and, to a less extent, the study of chemical incompatibilities, is, in general, unnecessary boredom for the medical student. The time once taken for such considerations should be allocated to introductory lectures in pharmacology which concern themselves with the relationship and, in a measure, the dependence and advancement of this subject on chemistry, especially that division of chemistry which concerns itself with the modification and adaptation of various organic chemical agents to tissues in such a manner as to influence them in a structural or functional fashion. Such time may also be employed in gaining an understanding of those fundamental factors which constitute the internal and most intimate environment of tissues, as temperature, hydrogen ion concentration, nourishment, osmotic pressure and water balance; the way in which these factors operate, and the necessity for their balanced adjustment in order to correct the pathological and maintain physiological life. Such an understanding will insure in this biologically-minded medical individual a greater appreciation for the naturalness of

things and circumstances and deflect him away from the value of extraneous, artificial agents. An abundance of time should be afforded an instructor in pharmacology for such presentations. They impress the student with the dependable importance of the subject, its solidity and the scientific principles on which its furtherance rests.

The teaching of the bulk of pharmacological information depends very largely on the personality of the instructor. The amount should not be large. The presentation should, of course, be from an experimental point of view, employing, first, normal tissues, and later a scattering of experimentally induced pathological states in which chemical action may be studied for the purpose of emphasizing the influence of such changes on drug action. It is only through this type of instruction, which in certain instances may finally be carried to the bedside, that a scientific therapeutics can be developed.

Pharmacology is a science which for the medical student finds its end reaction in its application. It is for this reason that it should not be detached and isolated from other related subjects. The pure science within it suffers no humiliation through its application. Very many physicians are very poor pharmacologists. The reason for this is that as medical students they were taught improperly. Highly specialized scientific details, beautiful in their intricacy, detached in their relationships concerning the structure and action of chemical agents were given them and here their instruction in this subject stopped. Such teachers appear to believe that it is beneath a certain dignity which they assume they have either to consider drug action philosophically or to transfer the beauty of this understanding to pathological tissues in which further modification of the action of substances may occur which are both complex and entrancing in their nature.

I assume that there is such a thing as pedagogical procedure and practice in the teaching of pharmacology. Such a teaching must be unsound if the information sought for and acquired is separated from the object it should illuminate and serve. For the medical student, not for the doctorate of philosophy in pharmacology, therapeutics, the scientific application of chemical agents in the modification of disease states and symptoms should be an essential part and in a justifiable measure the objective of such pharmacological understanding. Such a conception will enrich and extend scientifically the domain of pharmacology. There exists the possibility that if pharmacology is not extended from its detached status in the medical curriculum one of two things may happen to it. It will either be merged not as an entity but as a part of other subjects of the curriculum into them

and lose its identity as a science or it will be taught as unscientific therapeutics as a part of a department of medicine. Through such alternatives, the status of pharmacology will be marred.

An examination in pharmacology which reflects the ideals of a thoughtful examiner may have a definite influence not only on the teaching of this science but on its stabilization in the medical curriculum. The Examination Committee of the National Board of Medical Examiners has the hope of rendering this type of educational service. The examination in pharmacology should attempt to ascertain at least two things: first, does the applicant have sufficient information of pharmacological theory and of the scientific particularities embraced in this division of understanding, and second, with such information has he an even deeper understanding of how and when and when not to apply it. Examinations of this type will gradually advance pharmacology as an abstract science, on the one hand, and on the other, but more slowly, lead to the construction of a scientific therapeutics.

Teaching of Pharmacology from the Standpoint of the Clinician*

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I take it that the devotion of a morning's program of this Association to the teaching of pharmacology and therapeutics is an indication of a certain dissatisfaction with, or at least uncertainty concerning, the general effectiveness of present methods. Such a suspicion is supported by the comments of several eminent pharmacologists which have appeared in journals in the past few years. This may be serious, or it may simply represent the concern of the older members for the youngest of the family of medical sciences—a demand that she justify a separate existence and a certain jealousy lest she encroach on the domain of her older relatives.

In many schools pharmacology is included in the course in physiology; in a few, since the tools of pharmacology are nothing but chemicals, it has been adopted by the biochemists. Under either circumstance, it is regarded as the ugly step-child, and its right to respect, as the basis for a rational therapeutics in the prevention or cure of disease or relief of suffering, is at least minimized.

The close association of pharmacology and therapeutics, both in medical curricula and in the minds of physicians, is, undoubtedly, another factor in the difficulty pharmacology has had (in some places) in establishing itself. For, whereas physiology and pathology have been quick to adopt advances in physics and chemistry to the solution of their problems, therapeutics, I regret to say, is still too often an empirical art based on superficial observations and shallow analogies, as if the creations of a physician's imagination were realities, without bothering to ascertain whether they are true or not. And, because of the close association of pharmacology and therapeutics, the former was long held back and submerged in our teaching by the latter, whereas pharmacology should be the leader.

A few years ago, in a paper entitled "A Plea for Clinical Pharmacology," a professor of therapeutics, of the good old bedside school, urged the relegation of the pharmacological laboratory to the ascetic investigator, a sort of peculiar creature, who, when found, should be prized highly, but

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carefully locked up in a laboratory where there would be no danger of his coming in contact with students. These should learn "clinical pharmacology" (or therapeutics) at the bedside by listening to a man of experience—a position in which I can see nothing but a plea for empirical dogma, for a return to the authority of a local Galen. Yet this same professor of therapeutics urged that above all the student be taught to think! How a man can think therapeutically without a knowledge of pharmacology is as incomprehensible as how he can think surgically without a knowledge of anatomy.

For an internist to speak on the teaching of pharmacology seems not only anomalous but a bit presumptious. Certainly, the pharmacologist would seem the proper person to determine how his own subject should be taught. The only reason I can see for inviting an internist to take part in this discussion is that he sees the results, and at times the short comings, of this teaching in his work with students in their last two years, with house officers and with practicing physicians.

From the standpoint of an internist, then, what type of training in pharmacology seems to me of greatest use to the future physician?

The pharmacological knowledge of too many students seems confined to linking a certain disease with a particular drug, whose proper dose has been jotted down in a notebook carefully carried in the pocket. This is not pharmacology. Pharmacological knowledge must be based on an understanding of the alterations in normal or abnormal physiological processes which can be produced by the introduction of substances into the body. Except for directly parasitotropic agents, the student should realize that every time he gives a "drug" he is attempting to modify some physiological process, that the only way he can be sure that he has succeeded is by observing such a change; that the "dose" is the quantity required to produce this change—unless prevented by the development of toxic symptoms. The only way by which such a conception can be instilled is to give the student the opportunity to observe such changes in experimental animals and in man. In man the reactions are so complex and observation so extraordinarily difficult that unless the student has had training in making such observations himself on animals in the laboratory, he usually is completely befogged by his human experiment, and falls back on the comfortable (if the patient lives) or otherwise uncomfortable post hoc ergo propter hoc.

The goal should be to train the student so that when he is faced with a problem on the ward, he will make his diagnosis, so far as possible, in terms of disordered physiological processes, and will then ask himself

what pharmacological agents are at his command which might be expected to modify these processes. This accords with Dr. Lamson's suggestion for a classification of drugs primarily on a basis of the tissues on which they act. But the student must have more than this. When he contemplates the use of a particular drug for a specific purpose, all the other actions of this chemical in the body must flash across his mind, so that before deciding on its use he may balance the desired beneficial effect against the possible untoward or undesirable actions.

This, I confess, sounds like a large order. It is. It is more than can be expected from even the best single second year course. The formal course can but lay the ground work, giving the opportunity for observation and measurement of the effect of important drugs on the various organs of normal animals wherever possible, supplemented with discussion and description of other drugs where individual experiment is impractical.

There are, of course, many drugs of proven value whose therapeutic action it is impractical to demonstrate in the laboratory. But this does not detract from the necessity of teaching and demonstrating that drugs exert their effect in a measurable way, usually on certain organs or tissues to the relative exclusion of others. A remedy whose effect cannot be measured under proper conditions is generally valueless. Yet, here, perhaps, a word of caution is necessary—for while it is by demonstrable effect that the therapeutic wheat is separated from the chaff, there may be a few grains among the chaff which, because of the crudeness of our methods, we are unable to find.

In most of the preclinical sciences—anatomy, chemistry, pathology and physiology—didactic lectures have been replaced by laboratory exercises, while in medicine and surgery the clinic has largely given way to the clerkship. If these have proved of advantage to the student, why should he not be given the same opportunity in his preparation for the treatment of patients? To demonstrate a few frogs in the course in pharmacology, and then leave him to didactic therapeutics is on a par with a demonstration in physiology and only lectures on medicine.

Objection will be raised that I would make pharmacologists of all students;—far from it. Few have the necessary knowledge of physics and chemistry, to say nothing of the patience and imagination. But I would give them all the benefit of a pharmacological point of view, of enabling them to incorporate it as a cornerstone of their art, so that in their therapeutics they think in terms of pharmacology, just as in their diagnosis they should think in terms of pathology and physiology. Those who do not get it, either in school or subconsciously afterward, will never be better than "pill

slingers by rule," and fall into Cushny's group who "prescribe according to the precepts of their fathers and with less intelligence than their grandfathers."

To accomplish the result I desire, a close cooperation and cordial entente between the departments of pharmacology and medicine is essential. It is desirable to have at least one member of the department of pharmacology who not only has had some clinical training in the past, but who still has clinical contacts—on ward, in the outpatient department, or in the office. He can do much to prepare for the type of observation needed in the clinic.

Even more important than a man with clinical experience in the department of pharmacology is a member or group on the clinical staff with pharmacological training and interest. To these men must fall the further teaching of pharmacology and the completion of the training begun in the second year. Part of this can be done in a course in therapeutics, but it must be done wherever possible with patients, with a particular patient, whose disease is analyzed in physiological terms, and where the experiment is then made of administering certain chemicals, and the observed or measured results recorded. Then the changes attributed to the treatment must be scrutinized and those reasonably attributed to therapy separated from those due to the "vis mediatrix naturae." Even more can be accomplished by the pharmacological attitude on the ward and in the outpatient department. The student should be asked why he prescribed this preparation, what he expects from it, and how he is going to judge its effectiveness.

I have spoken thus far of what seems to me the most important part of the teaching of pharmacology—it involves the acquisition of a certain number of facts, but behind it all and most important is a point of view —an approach to the care of the patient. There are, however, some other lines which should be included in the routine course in pharmacology.

The day when the physician grew his own herbs, prepared his galenicals, or even compounded his own prescriptions has passed. In its place, we have the high pressure specialty salesman from the pharmaceutical manufacturer, who has a more varied and incomprehensible assortment than a homeopathic pharmacopoeia, but with equal assurance of cure. They are skillful salesmen, whose interest is to sell and not the proper care of the patient. Some of their wares are good—representing true advances in therapy. But, unless the physician has had some training, he will not distinguish the gold from the pyrites, and will reach eagerly for the proffered

therapy wheel where you set the pointer on any disease from ainhum to zoster, spin the wheel and read the firm's specific beneath the arrow.

A working, not hearsay, acquaintance with the United States Pharmacopoeia, the National Formulary and New and Non-Official Remedies is an adequate defense against even the most skillful detail man. The authority of the first two, their mode of revision, arrangement and manner of use should be understood thoroughly. The work of the Council on Chemistry and Pharmacy of the American Medical Association, and the purpose of N.N.R., the requirements for admission and reasons for deletion of articles submitted to it are more than worth the time spent in their study, not only for the protection of the future physician but for that of his patients as well. A few examples, such as allonal and A.B.S. & C. pills, discussed in detail usually make the principle clear, and brings the young doctor to ask his salesman caller, "Is it in N.N.R.?" I have gone into this detail because I believe that there is a real menace to intelligent therapeutics in proprietaries, and it is one of the minor ways, from the practical side, in which the present teaching of pharmacology falls short.

While most standard preparations can be procured from the pharmaceutical manufacturers in as good or as palatable a form as can be prescribed extemporaneously, still, a certain knowledge of the tools of pharmacology, of drugs as chemicals, is necessary. Since extensive courses in materia medica have been abandoned, this falls naturally to the pharmacologist to teach. Formulae, botanical names, etc., are a waste of time, but physical properties, solubilities and incompatibilities of gums, alkaloids, glucosides should be stressed sufficiently to be remembered. Here, again, a little laboratory experience is more effective than much memorizing.

The ignorance of many interns of the physical nature of many of the preparations which they discuss and prescribe is not only surprising but often leads to difficulty in the interpretation of orders and the filling of prescriptions, to the detriment of the patient and the embarrassment of the physician.

Prescription writing is a chore which usually falls to the poor pharmacologist to teach, a purely technical accomplishment, of about the same importance to the physician as writing a check is to the banker. A chore to teach and a bore to learn, but as with the check, there is a right and a wrong way to write it. If written correctly, you get what you want; if written incorrectly, you usually do not. In a second year course facility in prescription writing should not be expected; emphasis should be placed on acquiring the ability to write an unmistakable, fool proof, technically correct order to the pharmacist. In Latin or in English? I do not think

it matters, but not a mixture of both. There is, I believe, a distinct advantage in having prescription writing taught by a man who has had experience in having his prescriptions filled, or by one who has some behind-the-counter acquaintance with pharmacy.

Finally, what about toxicology? It is part of pharmacology, and with proper training, the student will know all the toxicology necessary for practice.

There has been considerable discussion within the past few years of the need for teaching in physical therapy. While by definition this is not part of pharmacology, I wonder if the action of physical agents on the body might not well be taught along with the action of chemical agents in it? The use of a mustard plaster would be much better appreciated if the effect of a hot water bottle were discussed or demonstrated at the same time. A thermocouple in a dog's lung while in the field of a diathermy machine, or measurement of lymph flow from a massaged and quiescent limb would do much to remove the mystery and fascination with which the "gadgets" of the physical therapist are surrounded. Certainly, it would be a tremendous help to the clinical teacher if the student came to the last two years of the course with some knowledge of the capacities of physical agents to alter physiological processes.

With the crowded medical curriculum, is it possible or advisable to give pharmacology the time required to develop the point of view I have discussed? The aim of the physician is to care for his patient; to cure him, if possible. Many patients will recover in spite of his ministrations; others will die. In a few cases it may be in his power to tip the scales. In these, except for the knife, he must rely chiefly on drugs. To provide him with knowledge and skill in the proper and most effective use of these cannot be regarded as an unimportant part of his training.

The Teaching of Pharmacology*

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The Association of American Medical Colleges, by devoting a session to a discussion of the teaching of pharmacology, might be considered to have conferred a compliment on the science were it not that the invitation to participate in the symposium was accompanied by the statement that state boards of medical examiners have notified the Association that applicants for licensure make a poor showing in pharmacology. Such a statement immediately places those responsible for the teaching of this subject in a defensive position and calls for a searching of heart or, perhaps, still better for a close scrutiny of the work which is being given to ascertain wherein it fails to accomplish its object. The charge of inefficiency must be met and answered, and in what is said in the following pages an effort is made to examine into the question and to discuss the subject frankly in order to uncover any weak points in the instruction and, if possible, to point out a remedy. Having devoted the time to this discussion, the Association is entitled to a frank presentation of the matter in so far as the limit of time and my ability permit.

The charge is made that the instruction in pharmacology—which may for convenience be said to include materia medica and therapeutics—is inefficient as is demonstrated by the results obtained in state board examinations. It goes without saying that if graduates are weak in any particular subject, the state board examinations would be the point where such weaknesses would appear, and, therefore, the boards would be in a position to give such information. It is necessary, therefore, to examine as closely as possible the grounds on which the charges are based. For our purpose merely a personal opinion is not sufficient. It should be supported by a statement of the low grades received in the examinations.

Accordingly, letters were addressed to the secretaries of all the state boards asking for such information as they could give as to the results attained in their examinations in this subject. Out of the forty-eight boards addressed replies were received from twenty-seven, practically only one half of those approached responding to the request. It is unfortunate that we could not have a larger response in view of the importance of the dis-

*Read at the Forty-sixth Annual Meeting of the Association of American Medical Colleges, held in Toronto, October 28-30, 1935.

cussion and the reason underlying the request. However, the results reported by the twenty-seven boards answering the letter give a fairly satisfactory survey of the situation as the reports come from all parts of the country. My own personal thanks and the thanks of the Association are due to those state board officials who responded to the request and in that way made this analysis possible.

Of the twenty-seven replies received, eight state that no examination in this subject was given and, therefore, the writers could not express any opinions. Of the nineteen boards which were able to give a report, seven said the showing of applicants in this branch was unsatisfactory, while twelve state boards said, that the results in pharmacology were "as good or better than in the other preclinical subjects" and that "they had no complaints to make."

Of the seven reporting poor results, two did not support their charges by any figures, merely expressing a personal opinion. Of the five remaining boards reporting poor results, one board reports that in 1934 twenty-four graduates took the examination and fifteen failed; in 1933, ten failed. Another state reported seven below 75 per cent in the past five years. Still another board writes that six applicants out of thirty-seven failed to make 75 per cent. And, finally, one state reports that out of 114 applicants, thirty-two, or 28 per cent, were below 75 per cent. This report further shows that in 1930, out of ten applicants only two got over 75 per cent, 80 per cent of those taking the examination failing. Among the eight failing we find two with grades of 28 and one with 40. When such universally low grades are reported, it would seem that a "searching of heart" is indicated by others as well as by the pharmacologists. It would be most interesting and helpful to have the opportunity to look over the questions which were asked these students.

Considering, now, very briefly the reports of the twelve states which had a more favorable showing, we may say that nine said, in effect, that the results in pharmacology were "as good as in other preclinical subjects" or "were average" or "compared very favorably." Oregon reports that thirty-three applicants had an average grade in the subject of 85.2 per cent. Michigan reports an average of 84 per cent. Illinois and Ohio were especially helpful in that they furnished a statement of the results obtained in all the examinations given over a period of years. Illinois examined 455 applicants from January, 1933, to October, 1934, and these had an average grade of 82 per cent for all subjects. During these years the average for pharmacology was 85 per cent as against 78 per cent for physiological chemistry and physiology and 77 per cent for pathology and

bacteriology and 79 per cent for anatomy. Illinois occupies a central position in the country and draws from a wide section so that its report is of significance, especially as a large group of graduates was examined.

For the same reason, the results reported from Ohio are important. The tabulated figures are arranged differently. The report, which covers the years from December, 1931, to June, 1935, gives the average of the six highest and the six lowest papers in all subjects for each examination.

	Average highest 6 papers	Average lowest 6 papers
Anatomy	84	62
Physiology	91	77
Pathology	86	78
Materia Medica and Therapeutics	87	80

Here, again, as in the case of Illinois, where large numbers have been examined, the position occupied by pharmacology is not one to be ashamed of, as it has the highest average in the lower grades and next to the highest in the high group.

Taking all these state reports into consideration, I think we are justified in stating that so far as we have been able to gather the facts from large groups of examination reports there is no special reason to worry over the position of the pharmacology grades in relation to those of the other preclinical sciences. In Illinois, it stands at the head of the list, and next to the top in Ohio so far as the best papers are concerned, while its low grade papers are better than the similar group in any other subject.

Still more striking figures are obtained from the results of the examinations given under the auspices of the National Board of Medical Examiners, which draws candidates from all sections of the country. Thanks to Mr. Everett Elwood, the Secretary of the Board, the grades of the examinations from June, 1931, to June, 1935, have been made available for study. The results for these six examinations were as follows, giving the percentage of failures in each subject, that is, the percentage of those who failed to make a grade of 60 per cent:

	Number Candidates	Number Failures	Percentage Failures
Pharmacology	2251	11	0.49
Pathology	2081	11	0.53
Chemistry	2309	14	0.61
Physiology	2314	62	2.68
Anatomy	2070	56	2.71
Bacteriology	2337	72	3.08

It would seem that we have in these National Board grades corrobative evidence to that furnished by the Illinois and Ohio Boards. In these

grades, obtained from over 2000 papers, pharmacology had the lowest percentage of failures of any of the preclinical subjects—less than one half of one per cent—and followed closely by pathology and chemistry, while physiology and anatomy yielded more than five times as many failures and bacteriology more than six times as many. It would seem, therefore, justifiable to conclude from this study that so far as can be ascertained from examining board reports the instruction in pharmacology is not inferior, to say the least, to that in the other preclinical subjects. Its showing is certainly as good as any of them. As to how it got its bad name is a question I cannot answer. Notwithstanding these facts, the high percentage of failures in two or three states has not yet been explained.

The conclusion which has been reached, that the position of pharmacology so far as results are concerned is not inferior to that of its kindred subjects, must not blind us to the fact that in many medical schools the subject occupies a rather unfortunate position and one which is bound to be reflected in its standard of teaching and in the development of the science in the United States. I refer, of course, to the fact that in many schools in this country the subject is still in leading strings, being not an independent unit but combined with one of the other preclinical departments, usually physiology or biochemistry. The effect of this union is, too often, to curtail the resources and hamper the growth of pharmacology. This is the situation in twenty-five medical schools in this country today. Five years ago there were only twenty-two such combined departments. In the twenty-five schools referred to, the head of the combined department is in no single instance a pharmacologist. Being a physiologist or a biochemist, where will his interest be, and in case funds for teaching and research are scarce, which child is likely to suffer—his own offspring or his stepchild? If one department is to be developed, which is it likely to be?

This is not said as a reflection on any one of these men. They are physiologists or chemists as the case may be, and it is their duty as well as their inclination to foster that subject which is their primary care. Probably no one of them desires the extra load and responsibility of the second department. It has been thrust on them. As the youngest of the preclinical group, pharmacology found well developed and strong departments in the other subjects, and the necessity for teaching this new science being thrust on already overburdened administrative officials, it fell to the lot of physiology and chemistry to nourish the youngster which had been left on their academic doorstep.

The unfortunate effect on the development of the subject is shown in various ways. For instance, of the twenty-five combined departments,

the heads of only three have seen fit to join the Society of Pharmacologists, membership in which is dependent on an active interests in the subject and contributions to its literature. How can we expect pharmacology to grow and develop under such conditions? The situation is a serious source of weakness to the pharmacologists of the entire country. In addition, these twenty-five schools together furnish only eleven members to the society from all the grades of their instructional forces, and seventeen of the twenty-five departments do not have even a single member. No one can fail to appreciate the unfortunate situation in its effect on pharmacology in both its teaching and research aspects.

As a contrast, we find that in the forty-six schools with independent departments there are sixty members of the Society. While this is a better showing, even it is not satisfactory inasmuch as in twelve of the same schools (over 25 per cent) there is not a single member. This peculiar condition is the result of several influences, one of which is the practice which has been in vogue in the past in some schools of appointing some general practitioner or other person untrained in pharmacology to head the department. There are thus in this country, due to one reason or another, twenty-nine departments of pharmacology, or 41 per cent of the total number, in which the Pharmacological Society is not represented. This condition cannot help but play an important part in determining the character of the teaching and the extent of the original contributions to the literature of the subject.

Another serious situation resulting from these dual departments is that these laboratories are practically lost to pharmacology as a training ground for men to fill vacancies in the teaching of the science. The departments are primarily devoted to physiology or chemistry, and the young assistants and instructors naturally are directed along those lines to the exclusion of pharmacology. One third of the laboratories in the medical schools of the country are thus lost to the science and in this way contribute largely to the present shortage of pharmacologists.

Another matter closely connected with and practically growing out of the situation described above, and one which is of importance in its relation to the teaching of pharmacology is the character of the training which the men who head these departments have received. In other words, are they Doctors of Philosophy or are they Doctors of Medicine? There would not seem to be the slightest doubt but that men who teach pharmacology should possess a medical degree. I am not denying that the training leading to the Ph.D. degree may be satisfactory for teachers of anatomy, physiology or biochemistry, but pharmacology is so closely interwoven with medicine in its many aspects that a knowledge of disease, such as is gained

in a medical course, would seem to be an essential. If the individual has a Ph.D. in addition to the M.D., so much the better. It is interesting to see how the combined and independent departments compare when measured by this requirement. Of the forty-six independent departments twenty-nine are presided over by men with the M.D. degree, while of the twenty-five combined departments thirteen are under men who have only the Ph.D. degree. These facts are pointed out in all frankness and with absolutely no personal reflection on anyone, but simply with a desire to emphasize some of the ways in which the scientific development and teaching in pharmacology are impeded and how it can be aided, to the end that stronger and better departments may be built up. It is a task primarily for those in administrative positions in medical schools.

I believe that the first essential for the strengthening of pharmacology in the country is to free those departments which are now bound to physiology and biological chemistry. This would put these departments on their own feet and develop a feeling of departmental responsibility. No longer would the department serve two masters, but in its new found independence, with the right man in charge, a feeling of pride would be engendered; original contributions to the science would follow, leading inevitably to admission to the Pharmacological Society and thus to the strengthening of the subject in this country. Given, then, a few years, they would be in a position to furnish men well trained in the science and prepared to take their places in the academic field.

But the story is not yet quite complete; neither is the improvement fully accomplished until the student learns how to apply his knowledge at the bedside during his course in therapeutics. The complaint is often made—again by state boards—that students do not know how to write prescriptions and only know proprietary preparations. There is doubtless some element of truth in this charge. It must be remembered, however, that the pharmacologist leaves the student at the end of his second year or in the middle of his third year, and it is safe to say that during his contact with the student any mention of proprietary remedies by the pharmacologist is only incidental and of minor importance. If later, when the student graduates or when he completes his hospital internship, he uses these preparations to the more or less complete exclusion of official drugs and preparations, the question arises as to who led him astray. Who is responsible for this change of front? The answer is clear—his clinical instructors.

Herein lies a serious aspect of the situation as the use of such unscientific methods of practice tends to grow on the young graduate to the gradual exclusion of rational methods of prescribing. Clinical instructors,

and, indeed, all visiting clinicians, who come into contact with medical students should in their prescribing confine themselves as closely as possible to the use of official drugs. The United States Pharmacopoeia of the present day will supply practically all the needs of the practitioner and at a much lower cost to the patient and hospital than any one of the widely advertised proprietary remedies with which the market is flooded. It is a sad commentary on modern medical education and practice that a large proportion of practicing physicians get their graduate instruction in therapeutics from the advertising pages of the proprietary remedies. The only way to avoid this is to give the student a thorough training in scientific pharmacology in his early years in the medical school and then to keep him in the straight and narrow path during his clinical years and through his hospital internship. It lies very largely within the power of this Association to accomplish this work.

Discussion
On Papers of Drs. DeGraff, MacNider, Hayman and Edmunds.

Dr. V. E. Henderson (University of Toronto): I cannot help agreeing with a great deal that has been said this morning. I have been very closely in touch with the pharmacologists in the United States, and I have seen a great many of their difficulties. I have been very sensible to what Dr. Edmunds has so well pointed out.

My own attitude to the situation which has arisen has largely been that in some of our prominent departments of pharmacology, some of our older departments of pharmacology, the heads of those departments have not been interested sufficiently in the clinical and the practical sides of their subjects. They have been interested in the theoretical and scientific pharmacology. Every pharmacologist should be so interested, but in his teaching the subject must be an applied one. We are using a particular tool, a drug, to modify physiological and possibly pathological states.

I think, if what Professor Edmunds says is true, one ought to have a degree in medicine to do one's work well, but I also feel that in a great many cases a Ph.D., who is in association with his medical colleagues in a properly organized department of pharmacology, where an effort is always made to consider the pathological and the clinical applications of his subject, may be a much better man that some of the M.D.'s I have known as teachers of medical students.

I am not at all sure that the first part of Dr. Edmunds' paper does not prove too much, if you take it in conjunction with the second part of his paper. The second part of his paper pointed out that pharmacology was very badly manned, the instruction was poor, and the first part of his paper pointed out that the results were excellent.

I am inclined to agree with what Dr. Edmunds implied. The answer to that paradox is the answer also to the statement that the pharmacologists of the United States are not living up to their duties. The answer is in the character

of the examinations and in the character of the examiners. It cannot lie anywhere else.

Various men have talked about the pharmacologists having the chore of teaching prescription writing. Of course, it is a chore, but I think my colleagues and I regard this chore as being the most useful thing we have to do, because in our prescription writing we try to bring home the application of the theoretical principles we are teaching. Nowhere can you bring home to a student better what you have taught in your lectures or in your laboratory work than in formulating a prescription intended to produce a definite effect.

One or two of the speakers have rather emphasized the importance of laboratory work. Personally, I have become rather a skeptic. Students' experiments can so often go wrong, and they can so frequently draw wrong conclusions even from well performed experiments. It is very difficult to overcome that. I think good demonstrations, with the tracings properly photographed and multiplied and put about for examination, is far better in many cases in enabling the student to see what the point of the experiment was, what real thought he should put into it, and what results he should get out of it, than his trying to repeat the experiment himself.

I think the practical point of view must be borne in mind. I am quite sure that in teaching, and in lectures you can teach the theory, the big theories, and the important scientific aspects of pharmacology just as well by choosing practical examples.

In conclusion, I would say that I think any pharmacologist fails in his duty if he does not take opportunity, which he will have abundantly, to show up the fallacies of the proprietary medicines. Yet we find the same effects here as everywhere else, that the students, when they enter practice, use proprietaries when they write prescriptions as an easy way out of the difficulty, and I think the fault lies with our clinical colleges.

Dr. William deB. MacNider (University of North Carolina): I have, in a certain measure, something of the same feeling which Dr. Henderson has expressed in connection with the teaching of pharmacology. The laboratory side of it is certainly the most important and stimulating side, provided the laboratory is handled in an understanding fashion.

Some twenty-odd years ago, when I first began this type of instruction in pharmacology, I thought for a while that the more complicated an experiment I could develop, which, in turn, was likely determined by the number of levers which I could have attached to an experimental animal, was the most satisfactory and instructive type of experiment. After a few years of this type of laboratory instruction I found that the students had just about forgotten that they were working with an intricate organism such as frogs, cats, or dogs, and that most of their time, if not all of it, was taken up in mechanically adjusting levers and getting what they called a perfect graphic record. The method which I had introduced into the laboratory had marred and just about obliterated its experimental thinking value. The longer I have taught, the simpler do I intend to make experiments, and to see to it as the students and I go along together in the laboratory that when something happens or fails to happen in the experiment that an attempt is made to analyze and understand the reaction. It makes little

difference to me whether such an analysis on the part of the student is correct or incorrect. The main point is that they should have sufficient interest and understanding to try to analyze it and interpret the results which were obtained.

When laboratory work is approached from this point of view it is an entrancing place for a young mind, and students enjoy it tremendously. If such a point of view of observation and interpretation be inculcated in a second year medical student he cannot help but carry this attitude directly to the bedside and put it into operation. This helps make of him a scientific clinician. If, on the other hand, students be given a laboratory guide with the understanding that in a given length of time they are to fight through an experiment, or a number of experiments, obtain a graphic record, and record the results, the instruction of this type is pretty nearly worthless to them. They have not had introduced into them through the experiment, aided by the instructor, a stimulus which will in turn make them think with reason toward understanding.

Dr. E. S. Thorpe (University of Pennsylvania): I, too, would like to call attention to the apparent paradox described by Dr. Edmunds. Those engaged in teaching pharmacology are dissatisfied, but the student achievement before the various examining boards seems to be good. That is as it should be.

I should like to question the poor results in some of the state board examinations. I wonder if Dr. Edmunds knows the personnel of those state boards submitting poor results. I wonder if those submitting these poor results are really qualified to express such opinions. I wonder if the questions used by such state boards really test the knowledge of well prepared students in a fair manner.

Dr. T. Sollmann (Western Reserve University): In listening to the papers, I thought I would not even be able to take part in the discussion, because all I could say was amen to everything that had been said, but in the discussion some points have been raised which I would like to speak on. The agreement in the major points is very striking. It shows that the objectives are fundamentally the same, and if they are the same, the means may be varied. I have changed my methods of teaching quite a number of times, and if I do not change them somewhat in the course of five years I think there is something wrong with me. That is, of course, partly because the subject changes but, also, because I, myself, change. There is a difference between teachers, and one reaches the same objective with one method a little better than another reaches it with another method. There is no uniformity. One must not expect it, and it would be a mistake to aim for it. But the objectives of furnishing the student who goes through pharmacology with a working knowledge of the tools to use in therapeutics, and then when he comes to therapeutics and medicine showing him how to use those tools, are evidently well understood and uniform.

Dr. DeGraff complained that the interns are not able to use what has been taught them, and I think that must be expected. There is a good deal of art to therapeutics, and I would not expect them, with the undergraduate instruction in pharmacology and therapeutics and all that goes with it, to be able to feel at home in the treatment of a patient with drugs, any more than they would feel at home in the treatment of a patient with surgery when they graduate. Those are things that come by practice. We give them the fundamentals; we tell them the method of approach, and then they have to use that over and over again.

That is what the internship is for, just to acquire this familiarity of practice. To complain that students do not have it when they start their internship would simply mean to say that internship is not necessary, and we all know it is.

As to examinations, there is great inequality in state boards. Perhaps a number of state boards feel they must try to ask questions that have not been asked for twenty-five years, so they would not be crammed for. In the materia medica it is fairly easy to do that, because there are certain subjects that have not been agitated in the last twenty-five years. For instance, I know that in a state board examination the question was asked: What is the origin of salicin? Twenty-five years ago that would have been a perfectly good question, but if a student told me today he knew the origin of salicin I would wonder what was wrong with him.

The paradox of the apparently good results in examinations and the unsatisfactory status of pharmacology in medical schools is a different subject. The results were especially good in the National Board, and the National Board questions in pharmacology are excellent from the point of view of understanding fundamentals, and of application. If anyone wants to know what modern pharmacology as taught in medical schools is and should be, there is no better place to look for it than in the National Board questions. Evidently, since the students are passing these well, they are being well taught in pharmacology.

Those who are teaching pharmacology under adverse conditions are doing the best they can. And it is because they are able to teach pharmacology that this rather pernicious (if I may be permitted to call it that) custom has been allowed to continue.

The difficulty is not in the teacher. The difficulty lies in the want of leadership, in advancement of the subject, of training and opportunities for recruits. As Professor Edmunds pointed out, it is there that sterility exists in American pharmacology and that we are now losing out and not doing what we should do.

Dr. Arthur C. DeGraff (New York University): I quite agree with Dr. Sollmann that the internship is the place where the student puts into practice the principles of therapeutics that he has learned in the medical school. We are fully aware of the inadequacies at the present time of such practice in hospital work, and that is one of the reasons for the survey Dr. Curran will tell you about in his paper.

Nevertheless, in the medical schools we should be sure that the student gets the proper method of approach, that he learns to think in proper terms in relationship to therapy, and that he also learns to plan certain therapeutic procedures. We feel that the primary function of the department of therapeutics is not to teach any particular brand of therapeutics or the therapy of any particular disease, but to inculcate in the student's mind the scientific approach to the therapeutic problem in order to fit him better for the treatment of patients when he goes into practice.

Dr. MacNider brought up the question of specific therapy. That term was perhaps stressed a bit too much in the presentation, but I wanted to be sure it was distinctly understood that in our plan in the department of therapeutics no attempt was made to discuss or to teach the therapy for a particular disease. It is true that specific therapy exists in only a few instances, but there are a great many times when certain recognized procedures are used with great benefit in

particular diseases, and these procedures are left for the particular departments where the disease is taught.

The department of therapeutics exists primarily, then, to teach basic principles, to correlate the previous scientific training with the teaching of therapy.

DR. C. W. EDMUNDS (University of Michigan): I have sometimes wondered myself, after writing this paper, what the pharmacology grades in examinations would be if we had seventy-two strong departments of pharmacology in the country. It is very interesting, as I showed in these large series, that the grades were, on the whole, very good. I am very sorry that I have been unable to get the questions from some of the states where there have been so many failures. I have written to each state and asked whether they would send me their questions, and in every case I have received the answer that no questions are available. The only questions I know of are the National Board questions, and I agree absolutely with Dr. Sollman in approving those questions. I have frequently taken questions from those examinations and given them to my own students. I would be perfectly willing to pass my students on those questions.

As regards some of the states where there are failures, one state in which there is no medical school reported that they had thirty-two failing out of 114—28 per cent—with 80 per cent of failures in one year. In another state further west, where the statement was made that the showing was bad, there is a medical school which has pharmacology under a combined department. The secretary of that state board wrote me rather an astonishing statement, which I can hardly believe did I not have his word for it. He said that at the end of the senior year all the graduates of the school in that state write to the manufacturing houses and ask for samples of their proprietaries so they can start in the practice of medicine. Presumably that statement is true, but to me it is almost unbelievable.

The Internship As a Problem in Medical Education: How the Problem is Being Met in New York*

J. A. CURRAN

Executive Secretary New York Committee on the Study of Hospital Internships and Residencies
New York City

GENERAL PROBLEM: The five boroughs of New York City present a most extensive and varied opportunity for hospital training of young physicians. The Council on Medical Education and Hospitals of the American Medical Association lists eighty-one approved general and special hospitals within this area offering 1,621 house staff appointments. Since the total for the entire United States is 9,006, it can readily be seen that more than one-sixth of these are to be found in New York City.

Graduates of medical colleges from all over the United States, Canada and several European countries, compete for these places. A group of more than 880 successful candidates was recently studied as to origin, and we were interested to find that only five medical colleges in the country were not represented. In addition, there were included graduates of six Canadian and twenty European institutions.

These candidates come, therefore, with backgrounds of varied viewpoints and teaching traditions. In many instances, they are drawn by the lure of a large medical center and the desire for a diversified experience. Frequently, with little thought, they have assumed that any New York City internship and residency must be a good one, because the hospital is in the midst of a great metropolis. From preliminary studies it appears that graduates of local medical colleges form slightly less than 50 per cent of the entire group.

The five boroughs of Manhattan, Brooklyn, Bronx, Queens and Richmond, therefore, in view of the large number of internships and residencies available in a well populated though compact area, present a favorable opportunity for study of the vital problems of preparing young doctors for their life work.

This opportunity is now being taken advantage of through the formation of the New York Committee on the Study of Hospital Internships and Residencies. Its personnel is composed of representatives of the five

*Read at the Forty-sixth Annual Meeting of the Association of American Medical Colleges, held in Toronto, Oct. 28-30, 1935.

medical colleges and five members of the Academy of Medicine. After organization of the Committee and election of a chairman, a two-year program was outlined. A substantial grant from the Commonwealth Fund was obtained to finance the project. A full time executive secretary and other secretarial assistance was provided to carry out the actual study of the hospitals, and necessary office space was made available by the Academy of Medicine. These provisions make possible a real opportunity for a thorough and intensive study of the problem.

It should be explained that this is not the first effort in New York City to arrive at a clearer understanding of this phase of medical education. For some years the Committee on Medical Education of the Academy of Medicine has been laying the foundation for the present work. It was recognized that the period in a physician's education between graduation from medical school and entering practice is vital and basic for all future types of qualification. Further specialization and development must be reared on this foundation. In order to further our work, the Academy Committee has turned over its data on this subject for us to use as source material.

The medical colleges also have been obtaining information by questionnaires sent to hospital superintendents and their own graduates. These have been used by graduating classes for reference in the perplexing search for good internships. These files have been consulted by us and were an aid in formulating our program. Such information, being from only two points of view and subject to the vagaries of personal bias, has been for the colleges of all too little value.

The American Medical Association, through its Council on Medical Education and Hospitals, which has rendered such conspicuous service in setting standards and raising the quality of internships, has in the course of its work published much valuable information concerning these hospitals, but it has only three inspectors for the entire country. It is possible for them to visit each hospital only once every three or four years. Dependence must be placed for annual report on a questionnaire.

At present in Greater New York, at any rate, with the exception of university hospitals, reliable information is meagre and frequently inadequate as to either the quantitative or qualitative value of internships. It is evident that a large proportion of the internships and residencies are sought for and obtained on no better evidence than hearsay, or the recommendations of a friend. Because of the throng of candidates, nervous anxiety of the man to secure a place, and the desire of the average hospital to fill

its quota with the "best men," little attention has been given to fitting the individual man to the job. Maladjustments and wastage have been the too frequent result.

But there is another phase of the problem which also has interested the medical schools, the Committee on Education of the New York Academy of Medicine, and certainly many of those in charge of hospital services. That is, what is the proper internship or residency? What kind of an opportunity or opportunities do young graduates need, are hospitals now approximating these needs, and if they are not, is it practical for them to do so?

A serious two-sided lack of information seems to exist between the medical colleges and the hospitals. Except for a few cases in which the medical faculty and attending staff are one, the schools are often forced to work in the dark as to the practical application of their teaching during the house staff experience. A greater lack of comprehension exists on the part of the attending staff groups of hospitals receiving these interns as to what is actually taught in school.

This lack of knowledge of what should be the content of the intern and resident experience while in the hospital is also due to a lack of appreciation on the part of the hospital staffs as to what their interns are going to do. The hospital intern and resident experience stands between the medical school and the practice of his profession. To even attempt efficiently to make the experience valuable, those making the effort must know what has gone before and what is to be expected afterward.

On even a superficial analysis of the content of internships and residencies, one finds in New York at least, amazing variations in the use and meaning of terms.

In certain hospitals, all resident house officers are called interns. So we find interns serving regular services anywhere from six months to three years. In certain hospitals the term intern is used for unpaid house officers, the terms assistant resident or resident for paid house officers. In other institutions the term assistant resident or resident goes with increasing authority. In still others there is no sense or orderliness in the use of the terms. A six months introductory service on pathology may dub the holder resident in pathology, from which position he moves upward to his internship in medicine or surgery.

The term intern is as confusing. There are junior interns also known as laboratory men or interns, wardmen, juniors, or pups. There are senior interns, sometimes called seniors, sometimes house physician or surgeon,

sometime assistant resident or resident. In one hospital the senior interns were called "residents" frankly with the hope of instilling a better sense of responsibility. This honor was without pay, however!

In spite of all this confusion, there may be said to be three general types of House Officer experience: (1) the Straight Service; (2) the Rotating or Mixed Service; (3) the Residency. The straight service only is well defined and includes one year of either medicine, surgery, pediatrics or pathology as a foundation for further hospital training.

Other internships are designated loosely as mixed or rotating. Complete rotating services have ranged in length from one to two and a half years, and are popular in the unfortunately designated "non-teaching" hospitals. Since they aim to give the intern a rounded training in several phases of medicine and surgery, they attract men who wish to have a "practical" experience before entering directly into private practice. Conscious of the criticism of superficiality if the rotation from service to service be too rapid, two hospitals, Roosevelt and St. John's in Brooklyn, have begun three year rotating internships in which, during the third year, the intern is rotated through the various services as the responsible house officer.

The term resident, as mentioned before, is used rather loosely. We will confine ourselves in using the term to mean a senior house officer who holds a position of responsibility and who receives financial compensation.

Even when limited to this description, three general types are found in New York. The first would be termed the "survival of the fittest" type. The resident is chosen from among the assistant residents, who have been chosen from a larger number of interns. Such residents, frequently have spent from three to five years in junior positions on the house staff of the hospital before being appointed, and usually remain as residents for two or more years. Second, is the arrangement where, after having served one or two years on a service, one works up automatically for a final year of responsibility and financial compensation, with the title of resident. Third, are the assistants on private pavilions, usually called residents. While they may have contact with a capable attending staff, the chief inducement is the salary paid. Their proper designation is paid assistants.

Considerable opportunities exist in a number of general hospitals for residents. It is believed by some, however, that they detract both from the training desired by the senior intern and also from the experience of the junior attending staff. This feeling, which is more common on the surgical services, is chiefly due to the competition for opportunity to carry

out major operative procedure. The greatest objection, as stated, is found on the general surgical services, less on the medical services, and the least on obstetrics, pathology, pediatrics and other special services.

The general plan of our investigation so far has been as follows:

First, the eighty-one approved hospitals are being studied individually over a two-year period. It is planned later to include those not on the American Medical Association's approved list.

The detailed study of each hospital situation is predicated on the ideal of having the executive secretary make himself as much a part of the staff as possible during the period of his stay. Care is taken to secure proper approach to the administrative, attending and house staffs. In the case of city institutions, a letter of introduction from the Hospital Commissioner is used. For all others, a letter from the chairman of the committee has given full entree.

On the first day, at an interview with the superintendent or medical director, valuable information in a systematic form is secured as a guide to hospital organization. In addition, blanks are furnished to secure a record of hospital statistics, list of conferences, clinics, rounds and meetings, with dates of each, names and rank of attending staffs, names of residents and interns with data as to medical college attended, previous experience and present service, copies of instruction booklets and departmental procedures, case record outlines, library resources, statistics as to patients on all services, percentage of autopsies and, last but not least, a history of the institution.

Following this, an inspection of the entire hospital is undertaken, including interns' quarters, to obtain a general picture of the institution and to facilitate later studies. With experience, a great many valuable observations may be made, during such a tour.

Interviews are then arranged with the chiefs of services and departments, members of the attending staff, residents, interns, record librarian, superintendent of nurses and director of social service. Naturally time will not permit seeing the entire staff individually, and a system of sampling is used with the idea of getting the viewpoint of a representative number. Certain points of information found through experience to be of basic and comparative value are recorded systematically. In addition, each individual is encouraged to speak freely of his problems and ideas. Naturally, reticence may hold back complete information, but several persons, separately interviewed, tend to give the whole story. Through previous medical college and hospital connections, organized medical activities and in

practice, the executive secretary has found acquaintances in nearly every hospital among the visiting or house staffs. This has tended to break down barriers and encourage friendly cooperation.

Rounds, operations, obstetric deliveries, seminars, journal clubs, conferences, clinical meetings, informal ward activities and outpatient clinics are attended. Observations so made are extremely valuable. At times, there is a tendency to "put on a show" for the visitor, but usually there is little or no advance notice. Besides obvious artificiality, it is hard to make an intern an active participant at rounds, for example, if his previous rôle has been an entirely passive one. One of the chief difficulties the investigator experiences is the mistaken hospitality of the attending staff member who insists on showing the visitor the cases, rather than carrying on as usual. Attendance at weekly and monthly staff conferences are of great value in appreciating the spirit and plan of a service.

Careful estimation is attempted of the factors entering into the success of these activities from the point of view of the house staff. Certain points are particularly investigated.

Concerning the Interns: First: Their attitude toward the patient, the administration, the nursing group, their attending staff and toward each other.

Second: The quality of their work as shown by their records and the knowledge of their cases.

Third: Their general morale, which is rather easily determined.

Fourth: Their opportunities and responsibilities.

Fifth: Initial instruction as to the techniques of the service, how and by whom given; are they given a manual or written service routines so they may know what is to be expected of them.

Sixth: Whether the intern's place in the operating-room is carefully planned; his introduction to techniques provided for, and his interests safeguarded.

Seventh: Attention paid to his competence in such relatively simple procedures as venapuncture, hypodermoclysis, and spinal puncture.

Eighth: Whether he presents cases at conference, and if so, whether he is taught proper exposition.

Ninth: Whether the interns and residents participate in the outpatient program, and whether they find the experience valuable or not.

Tenth: Whether the number of interns is adequate, and their time properly planned. In some hospitals, it seems as though they partake of the nature of glorified errand boys. At conferences, this is especially apparent,

TABLE 1. MEDICAL COLLEGE REPRESENTATION
PRELIMINARY REPORT OF THIRTY OUT OF EIGHTY-ONE HOSPITALS
ALREADY SURVEYED

State and Medical College	Total	Residencies	Internships		
			Rotating	Mixed	Straight
Grand Total	880	297	454	105	24
U. S. A. Total	804	278	404	101	21
Arkansas: Univ. of Arkansas	3	2	1		
California: Univ. of California	2	2			
Stanford University	2	1			1
Colorado: Univ. of Colorado	4	3		1	
Connecticut: Yale University	23	16	5	1	1
D. C.: Geo. Washington Univ.	11	2	9		
Georgetown University	14		13	1	
Howard University	5	1	4		
Georgia: Emory University	5	2	3		
Illinois: University of Illinois	3	1	1	1	
Loyola University	6		6		
Northwestern University	5	3	2		
University of Chicago	3	1	2		
Rush	11	4	6	1	
Indiana: University of Indiana	2	1		1	
Iowa: State University of Iowa	3	2	1		
Kansas: University of Kansas	2	1	1		
Kentucky: Univ. of Louisville	1		1		
Louisiana: Univ. of Louisiana	1		1		
Tulane University	8	5	3		
Maryland: Johns Hopkins Univ.	31	24	2	4	1
University of Maryland	16	3	13		
Massachusetts: Boston University	6	1	5		
Harvard University	39	22	4	10	3
Tufts College	8	2	5	1	
Michigan: Univ. of Michigan	16	9	7		
Wayne University	1	1			
Minnesota: Univ. of Minnesota	2	2			
Missouri: St. Louis University	6	1	5		
Washington University	5	2	1	1	1
Nebraska: Creighton University	8	2	6		
University of Nebraska	8	4		1	3
New York: Albany Med. College	9	4	4	1	
University of Buffalo	3		3		
Columbia University	102	29	42	29	2

State and Medical College	Total	Residencies	Internships		
			Rotating	Mixed	Straight
Cornell University	58	20	16	17	5
Long Island College of Med...	67	13	50		4
N. Y. Homeopathic Med. Coll.	55	8	47		
New York University	128	14	90	24	
University of Rochester	10	6	4		
Syracuse University	17	4	12	1	
North Carolina: Duke Univ...	6	3	2	1	
Ohio: University of Cincinnati....	5	4	1		
Ohio State University	4	2	2		
Western Reserve University....	8	7	1		
Oklahoma: Univ. of Oklahoma..	4	1	2	1	
Oregon: University of Oregon....	1	1			
Pennsylvania:					
Hahnemann Medical College..	3	2	1		
Jefferson Medical College	9	5	4		
University of Pennsylvania....	14	9	4	1	
University of Pittsburgh	3	3			
Temple University	2	1	1		
South Carolina:					
Med. Coll. State of S. Carolina	2	2			
Tennessee: Univ. of Tennessee..	2		1	1	
Maharry Medical College	1	1			
Vanderbilt University	3	2	1		
Texas: Baylor University	3	2	1		
University of Texas	5	5			
Vermont: University of Vermont	3	1	2		
Virginia: University of Virginia	8	4	2	2	
Medical College of Virginia....	4	2	2		
Wisconsin: Marquette University	1	1			
University of Wisconsin	4	3	1		
Total for Canada	25	14	5	3	3
Canada:					
Dalhousie University	1		1		
McGill University	11	4	2	2	3
Queens University	5	4		1	
University of Toronto	6	5	1		
University of Western Ontario	1	1			
University of Montreal	1		1		
Foreign Total	51	5	45	1	

being constantly called away under the mistaken policy that no minute of the intern's day is sacred and he must respond immediately to each call, no matter how trivial or what the occasion.

Eleventh: Whether the house staff spirit and initiative result in special reading, group case studies or seminars. It is striking how in one hospital the entire group will be present at an evening meeting, while at another, attempts at intern seminars break down because of the sacredly guarded privilege of getting out of the hospital every other evening.

The following points concerning the attending staff are investigated: Inquiry is made as to their qualifications, and observations are made as to their willingness and ability to teach the interns, their attitude toward patients and their colleagues, their general morale, and their willingness to supervise the work of the interns.

Concerning the Administration: Scrutiny is given to the following items: What is the character of intern housing and food? What precautions are taken concerning their health? What are the provisions for vacation?

In addition, valuable information has been secured by informal visits to the library, if such exists, the ward laboratories at odd times, the record room, both to learn the system used and to study case records, and special departments and laboratories such as radiology, pathology, physical therapy and electrocardiography.

Utilization of these various methods of approach to the whole problem permit a quadrulateral viewpoint; namely, that of the administrator, the attending staff, the house staff, and that of the investigator.

Record of findings:

Besides the systematically recorded interviews and observations from each hospital, a detailed report is written while the situation is vividly in mind. An outline is followed to insure uniformity and ready access for reference. The majority of the hospitals are anxious to have the benefit of a report of the findings of our survey. The logical time for it is soon after the hospital study has been completed. It presents an opportunity to the investigator to check his assembled findings in the light of criticism received from the medical board and the superintendent to whom the report is read. After some trial and error a form of report was devised which seems to be satisfactory.

The acid test of the value of the house staff experience to the man, is its usefulness as applied to the actual conditions of practice. With this in view, it was decided that valuable information could be secured from selected graduates of the five medical colleges cooperating in the study,

similar to what Dr. Weiskotten has done for graduates of all medical colleges. In our study, however, effort is being made to get more detailed information concerning the character and quality of internships.

Six classes: 1919, 1920, 1924, 1925, 1929 and 1930 were chosen, totaling approximately 3,000 individuals. The Committee has been fortunate in having the assistance of Dr. Lowell Jacob Reed, professor of biostatistics at Johns Hopkins University, who has not only given valuable guidance in this phase of the work but in preparing the statistics of the entire project.

At present, this group study is approximately one-half completed, but replies received indicate an enlightening method of evaluating internships and residencies, as well as other methods of special training, as viewed from the vantage point of practical application.

To mention a single question,—that of surgical experience: It will be of great value to educators to learn what proportion of interns who have received special training in operative surgery have either immediate or remote opportunity to use this training. Conversely, how many doing major surgery had an adequate internship or subsequent experience?

Another question of importance is the number doing obstetrics whose training is insufficient or the extent of obstetric instruction, wasted on men who have not used it.

The Committee has wondered if information of value to the medical colleges might not be obtained by testing the reaction of the interns to their medical school experience. Such an attempt is being made and promises data of interest not only for individual institutions but for the colleges in general.

Subcommittees have been appointed in order to make the best use of all the material gathered and to avail themselves of the assistance of representative workers in various fields. The latter have been drawn from hospitals throughout the city. These committees deal with: the general internship, medical residencies both general and special, surgical residencies, also including special groups, obstetric residencies and the remaining specialties such as radiology, pathology and physical therapy. These groups are organized and have their apportioned tasks under way.

At this point I would again like to stress that the Committee's work is far from completed. Two years were allotted for the collection of facts, and the examination of individual hospitals must be finished by July 1, 1936. We are not, therefore, in a position to reach any final conclusions.

However, there are certain factors in the various hospitals which already may be said to determine, at least in part, the efficacy of intern training.

First.—The spirit of teaching and investigation so necessary if the intern is to receive adequate training. It is best stimulated in an institution with a medical college affiliation or with a considerable number of medical faculty members on its staff. Its development to a high degree in other hospitals has been comparatively rare.

Second.—An active director at the head of each service to insure uniformity of program. Almost without exception, when medicine and surgery is divided between independent attending physicians and surgeons who rotate on duty, the quality of the service is not of the best. However, in some hospitals the director is a mere figurehead, giving little time to the hospital. It seems impossible to delegate such responsibility to an assistant. Not only must the responsible chief of the service be competent and active professionally, but he must have real executive ability as well.

Third.—A well outlined and understood system for conducting each service, both as to staff participation and procedures used. For the average hospital a loose-leaf procedure book for the medical as well as the nursing staff seems desirable. Frequent revisions must be made. Such a system insures, at least, adequate minimum care for each patient and the basic essentials for medical training of the house staff.

Fourth.—There is a definite correlation between the adequacy of intern training and the quality of records kept. No hospital has been visited where the education of the intern could be called satisfactory, where the records were not orderly, accurate, checked by the visiting staff and properly filed. From such recording of routine case records and progress notes will come naturally the exposition of special cases or groups of cases for conferences, medical societies or for publication.

Fifth.—Facilities and a tradition for reading fostered by the visiting staff, seem a basic essential. In the majority of hospitals visited so far, opportunities to read have been deficient. Even with a good supply of books and periodicals, the library is a dubious asset without the services of a librarian. The interns need both guidance and appreciation in the use of the literature.

Sixth.—The spirit and morale of the staff: In inspecting a hospital, it is at the same time the most intangible and the most obvious factor encountered. The visiting staff members must command the respect and loyalty of their residents and interns if proper ideals are to be fostered.

Seventh.—The spirit of cooperation and mutual respect between the medical and nursing group: In most instances, the poorer the hospital for intern training, the more frequent the difficulties between these allied services.

Eighth.—Attitude toward the patients: Genuine interest in the patients by the staff,—courtesy, kindliness tempered with discipline, are again intangible factors with evidences that cannot be missed.

Ninth.—A proper appreciation of the social aspects of medical problems. Too often there is no thought given to the social problem or it is left entirely to the social worker.

CONCLUSIONS

In conclusion, it has been evident from our study that the medical colleges of New York City and the Academy of Medicine, exert a powerful influence over the hospitals. Lacking the approval of these local educational institutions increases the difficulty of the hospitals in securing good interns.

The investigation has tended to focus the attention of the leading members of the medical profession on the entire problem of intern and residency training. A realization of responsibility and a growing enthusiasm develops as the survey progresses.

Group study of separate phases of the problem by the subcommittees, widens the circle of active interest and participation by representative members of hospital staffs all over the city.

The followup interview has resulted in definite results. Health examinations for interns have been instituted, experimental rotation of interns through the outpatient department initiated, a program for teaching new interns nursing procedures set in operation, libraries have been developed, methods of keeping case records improved and an interest aroused for review of each hospital's potentialities and possibilities for resident staff education.

It is the intention of the Committee to make available its findings in the form of a report. It is hoped that as a result of its study, there will be developed by the five New York City medical colleges and the Committee on Education of the Academy of Medicine, a permanent organization to give accurate guidance to prospective interns and to act as a clearing house of information.

Finally, it is hoped that this study may stimulate similar undertakings in other parts of the country, so that medical students may be better guided, so that hospitals will learn to take their full responsibility in the training of doctors and so that hospital services everywhere may be elevated in the care of patients, in education and the advancement of medical knowledge.

Report of the Committee to Evaluate the Medical Aptitude Test*

To the President and Members of the Executive Council
of the Association of American Medical Colleges,

Gentlemen:

Your committee appointed to report to you concerning the Medical Aptitude Test sponsored by this Association during the past few years begs leave to report as follows:

The Committee has held two meetings. At the first of these the committee determined upon a plan of investigation which appeared proper and feasible, and reported that plan to the Executive Council at its meeting held at Atlantic City on June 9, 1935. This plan was as follows:

A. To determine by statistical analysis the correlation between the scores made by a significant number of those who have taken the test and their subsequent performance in medical school.

B. To obtain from experienced psychologists and others who are familiar with the use of such tests, opinion concerning the present form of the medical aptitude test.

Having received from the Executive Council official approval of this plan, the committee then proceeded to put it into effect. Dr. Carroll E. Palmer, Associate in Biostatistics in the School of Hygiene and Public Health of the Johns Hopkins University, was engaged to carry out the statistical analysis of the test. This was done during the summer of 1935. Dr. Edward L. Thorndike of Teachers College, Columbia University, Dr. Robert A. Brotemarkle, Personnel Officer of the University of Pennsylvania and Dr. F. L. Wells of the Psychology Laboratory of the Boston Psychopathic Hospital were consulted and have rendered opinions concerning the form of the test as employed in the past. The findings of these gentlemen are appended to this report as exhibits. After considering the data shown in them the committee has come to the following conclusions.

*The report published in the JOURNAL January, 1936, pp. 15-32, incl., is the statistical study made by Dr. Carroll E. Palmer, for the Committee. It was presented by the Committee as such. The present report is the report of the Committee itself which was made to the Executive Council, the chairman of the Committee, Dr. Chesney, made an informal verbal report to the Association. The report here published was accepted by the Executive Council.

CONCLUSIONS

1. That the Moss Medical Aptitude Test has definite value within certain limitations.

2. That its value varies with different schools.

3. That it should be continued by the Association.

4. That attempts should be made to improve it, along the lines indicated in the letter of Dr. Thorndike. Perhaps accumulated balances to the credit of the test could be used for this purpose.

The committee desires to record its appreciation of the hearty cooperation afforded by Dr. Moss in this investigation, also its gratitude to the gentlemen who gave the committee such valuable assistance.

Respectfully submitted,

(Signed) EDWARD S. THORPE, JR.
WORTH HALE
ALAN M. CHESNEY, Chairman

Intern Placement Bureau

At a meeting of the Executive Council held in Chicago, February 16th, it was decided to proceed with the establishment of an Intern Placement Bureau. Plans for the operation of this Bureau had previously been submitted to cooperating committees appointed by the American Hospital Association, the American Protestant Hospital Association and the Catholic Hospital Association and were approved by these committees.

The Bureau is to give service only when requested to do so and is not intended to secure placement for any but deserving graduates whose scholarship warrants this service, nor will it give service to non-approved hospitals. Hospitals whose staffs have been organized in such manner that the education of the graduate will be continued acceptably will receive special consideration.

Deserving graduates sometimes fail to secure an acceptable internship and first class hospitals sometimes fail to fill their intern quota.* For these graduates and hospitals the Bureau will be useful. Blanks have been prepared to be filled out by the medical school, by the graduate and by the hospital. These blanks will give information which together with the information on file in the office of the Association regarding the scholastic attainment of the graduate, and the information regarding hospitals collected by the American College of Surgeons and the American Medical Association—which has been placed at the disposal of the Bureau—will be the basis for placement.

It is the concensus of opinion of all parties concerned in this plan that there is great need for such a Bureau; that it can meet a demand which is growing greater year by year and that it should be an activity of the Association of American Medical Colleges, one which is a continuation of other activities of the Association. Time and experience will determine making necessary changes in procedure and the success or failure of the Bureau, but with the wholehearted cooperation promised by all associated activities—the medical colleges, the hospitals and the evaluating agencies in the hospital field—it is probably justifiable to assume that the plan will eventually prove successful. Sympathetic and kindly forbearance, constructive criticisms and cooperation will make for success.

The committees appointed by the Hospital associations are:

AMERICAN HOSPITAL ASSOCIATION

DR. A. C. BACHMEYER, chairman, University of Chicago Clinics.
DR. WM. D. CUTTER, Council on Medical Education and Hospitals, A. M. A.
DR. M. T. MAC EACHERN, American College of Surgeons.
DR. FRED C. ZAPFFE, Association of American Medical Colleges.

AMERICAN PROTESTANT HOSPITAL ASSOCIATION

DR. C. S. WOODS, St. Luke's Hospital, Cleveland, Ohio.
REV. N. E. DAVIS, Board of Hospitals, Homes and Deaconess Work, Columbus.
MR. JOHN STEELE, Baptist Davis Hospital, Pine Bluff, Ark.

CATHOLIC HOSPITAL ASSOCIATION

DR. DANIEL J. PESAGNO, Mercy Hospital, Baltimore.
DR. FRED JACOB, St. Francis Hospital, Pittsburgh.
DR. BRYAN M. RILEY, Creighton Memorial-St. Joseph's Hospital, Omaha, Nebr.
DR. JOSEPH W. BRENNAN, St. Michael's Hospital, Toronto.

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Student Accomplishment

The complete report on student accomplishment—freshman class of 1934-1935—for all arts colleges has been mailed to the deans of the schools participating in this study. Although this study has been made since 1928, these reports have been issued only since 1929. Reference to them will disclose how the students from the arts colleges, about 600 in number, have carried on in medical schools year by year and thus serve as an additional aid in the selection of prospective medical students.

The arts colleges are advised of the accomplishment of their students as reported by the medical colleges, a service which is being appreciated more each year. In return, these colleges give the standing in class, by thirds, of their students thus making it possible to correlate college with medical school accomplishment. The report on this correlation for the 1933-1934 freshman class was published in the JOURNAL, May, 1935. The report for the 1934-1935 class will be published as soon as complete data are available for the study.

◆ ◆

Association of American Colleges

The Association of American Medical Colleges was represented at the 22nd annual meeting of the Association of American Colleges by Drs. John Wyckoff and Fred C. Zapffe. They participated in the discussion of the topic "The College in Social Progress from the Standpoint of the Professions" presenting the viewpoint of medical education.

An amendment of the constitution of the association was indicative of a noteworthy change in the viewpoint of educators. The standard of 15 units of high school work for admission to college was deleted, thus leaving admission entirely in the hands of individual colleges but subject to a rigid inspection of procedures by regional evaluating agencies. Also deleted was the requirement of 120 hours for graduation and the awarding of a bachelor's degree. Thus, accomplishment, rather than time is emphasized, promising better education and less "training" of students. This point was strongly emphasized by the secretary of the association in his report.

Many educators are of the opinion that the entire scheme of undergraduate education is in need of reorganization; that oral standards are inadequate now; that so-called "basic" education demands new standards and procedures in education. It is realized that professional education must be recognized in this reorganization and that there has been misunderstanding as to what is regarded as basic by the professions. Closer cooperation is desired and steps are being taken to bring it into being by the creation of cooperating committees representing all interests in education.

◆ ◆

The 1935 Freshman Class

The returns from seventy-eight medical schools of the United States show that the enrolment in the 1935-1936 freshman class is the smallest since 1931. Enrolment blanks have been received for 6,151 students. A considerable number of these students have already withdrawn for various reasons so that by the end of the academic year the actual number reported on as having continued in college will probably be not more than

6,100. The reports on accomplishment made to this Association at the end of the academic year make it possible to give accurate figures as to numbers of medical students in attendance in each of the four years of the medical course.

Such a record has been kept by this Association since 1928. The figures for each year since then are as follows: 1928:—6,199; 1929:—6,277; 1930:—6,315; 1931:—6,097; 1932:—6,457; 1933:—6,650; 1934:—6,754; 1935:—6,151 (less withdrawals early in the course). In 1935, at least 10 per cent fewer students enrolled than in 1934.

It is extremely gratifying to note this reduction in the number of medical students. Of the number enrolling this year about 25 per cent will fail to graduate, thus bringing the number of graduates in 1939 down to about 4,600, more than sufficient to replete the ranks of the profession.

◆ ◆

Study of Applicants for 1935

The study of applicants for 1935 is nearing completion. Thus far two facts stand out clearly, namely, that more applications were made than in 1934, and that there were fewer acceptances in 1935 than in 1936. It is not possible at this time to give the data on the number of applicants or how many were accepted for admission to medical school. However, as stated in a previous item, the enrolment for 1935-1936 was considerably less than in 1934—about 10 per cent.

◆ ◆

Freshman Class of 1935-1936

The 78 medical schools included in the annual study of student accomplishment have reported an enrollment in the present freshman class (1935-1936) of 6,147 students—9.2 per cent fewer students than were reported on at the conclusion of the 1934-1935 year. This is a considerable reduction and will be even greater by the end of the present academic year as anywhere from 50 to 100 students withdraw every year soon after the beginning of the session. Curtailment of enrollment appears to have been in effect in many medical schools, although not in all. A few schools have enrolled more students in the freshman class this year than in the preceding year.

Inasmuch as about 20 to 25 per cent of students entering on the study of medicine fail to graduate, it may be assumed that in 1939, the number of graduates will not exceed 4,800, perhaps not 4,600.

Another noteworthy point is the preparation for the study of medicine of these students. Each year for many years past, the number of students coming with the minimum of two years—or 60 hours—has grown smaller, and the number presenting a degree has grown larger. This year only 11 per cent has less than three years of preparation, and of these, only 9 per cent had the minimum. Two per cent had more than two years but less than three years. Thirty per cent had from three to four years; 7.8 per cent had four years but did not receive a degree. The degree of A.B. was held by 29.6 per cent; B.S. by 20.9 per cent and other degrees (Ph.B., Ph.D., B.C.C.) by 0.7 per cent.

Thus the demand for increasing the entrance requirements to three years would not appear to be as essential as it once was. Perhaps prospective medical students are beginning to realize that a longer stay in college, a better preparation including much more than the required minimum in science is decidedly advantageous—a fact borne out by the annual study of student accomplishment. Of course, there are individual exceptions to this, but, on the whole, broadening an educational foundation by taking courses in the humanities and other cultural subjects does give a better preparation for the study of medicine. More and more it is getting to be a 4 and 4 proposition and less and less a 2 and 4 preparation. The

three year group is remaining fairly static year by year. The increase in years of preparation is in the degree group. True, the degree by itself is not to be regarded as an index of better preparation, but it does represent more preparation which cannot fail to have advantages. Thus, two of the problems which have caused much discussion in recent years—lessening the number of students entering on the study of medicine and longer preparation for such study—are being solved quite effectively and adequately.

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Congress on Medical Education

The thirty-second annual congress was held in Chicago, February 17 and 18. The attendance was a most satisfactory one. The program received much favorable comment. The papers bearing on medical education, read by medical and non-medical men, were to the point, informative and full of much food for thought. One of the best papers read was contributed by Dr. George F. Zook, director of the American Council on Education, Washington, D. C. Dr. Zook has a splendid grasp of the situation and his suggestions as to procedure and reorganization of the entire scheme of education were wholesome and wise. Dr. Zook evidently has given the matter careful consideration, which, coupled with his wide and extended experience in education, lead him to draw conclusions which are wise and timely. As the presses are being held to receive this copy, it is not possible to make mention of other valuable contributions, but the paper presented by Dr. E. P. Lyon, titled "Swans Sing Before They Die," must be mentioned. Dr. Lyon retires from the deanship of the Medical School of the University of Minnesota, which he has held since 1910, and becomes professor emeritus. His review of his experience and his suggestions based on this experience, merit careful thought.

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Dr. Lewis J. Moorman Honored

Dr. Lewis J. Moorman, former dean of the University of Oklahoma School of Medicine, was recently named to Oklahoma's Hall of Fame by the Oklahoma Memorial Association in recognition of his achievements in medicine. Doctor Moorman has been president of the Oklahoma State Medical Association and of the Southern Medical Association.

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American Council on Education

The American Council on Education has decided to hold meetings in various parts of the country, setting up areas, to be attended by the secretaries of various educational organizations and groups, at which problems relating to general education will be discussed. These groups will report to the parent organization, thus bringing up in a most effective manner questions which should be considered by all educational organizations. The secretary of the Association of American Medical Colleges has been selected to take part in the discussions of the Chicago Area group which will meet February 27th in Chicago. A report on this meeting will be made later.

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National Education Association of the United States

This Association, together with the Bureau of Superintendence, has set up an Education Policies Commission which will consider problems in general education. The secretary of the Association of American Medical Colleges has been appointed a member ex officio of this Commission.

College News

University of Illinois College of Medicine

Construction will soon begin on a three story addition to the Surgical Institute for Crippled Children. The building is to cost about $150,000 and will provide forty additional beds.

A Federal grant of $1,220,000 (30% to be given outright, 70% as a loan) for building the second unit of the Medical and Dental College Laboratories Building in Chicago has been approved at Washington and the Board of Trustees has received bids for the work.

Unit No. 3 will house pathology, public health, bacteriology, laboratory diagnosis, and a new set-up for X-ray. On the upper floors of this building will be housed the College of Dentistry. Dental students are given work in the fundamentals in the same laboratories as the medical students. Work has already begun on this project and should be completed in about a year and a half.

Funds for the new unit were originally appropriated by the state legislature in 1931 but the University at that time voluntarily turned back the money because of the State's acute financial condition. This year the legislature authorized the University to borrow money from the Federal Government for the completion of the plans and at the same time provided means for repaying the loan to the Government. It was the hope of the Board to have the new units ready for occupancy by the fall of 1936, thus enabling the College of Dentistry to abandon its old quarters, bring nearly all of the professional departments under the same roof, thus increasing the continuity of the work and the "belongness" of departments which have not been on the regular campus.

Albany Medical College

New appointments: Dr. Harry E. Himwich, associate professor of physiology at Yale University School of Medicine, as assistant professor of physiology, succeeding Dr. F. Stanley Randles, resigned. Joseph L. Schwind, Ph.D., associate professor of anatomy at Georgetown University School of Medicine, was appointed to that position, succeeding Donald H. Barron, Ph.D. Dr. Barron has resigned to pursue research at Oxford University, England.

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Boston University School of Medicine

Dr. Reginald Fitz, associate professor of medicine at the Harvard Medical School and staff member at the Peter Bent Brigham Hospital, will succeed the late Dr. Allan Winter Rowe, who was director of research at the Evans Memorial at the time of his death last year. Dr. Fitz will become director of the Evans Memorial, and will be professor of medicine in the Boston University School of Medicine. In becoming director of the Robert Dawson Evans Memorial, department for clinical research and preventive medicine of the Massachusetts Memorial Hospitals, Dr. Fitz will continue research which will be an important part of his work as director. Dr. Fitz is chairman of the committee on medical education and medical diplomas of the Massachusetts Medical Society, and is chairman of the division of medicine at Harvard Medical School as well as the University marshal at Harvard. He is a member of the Council on Medical Education and Hospitals for the American Medical Association and also is a member of the national Board of Medical Examiners.

The appointment of Dr. Howard M. Clute as chief of the Surgical Service of the Massachusetts Memorial Hospitals and professor of surgery in the medical school, will make him the successor of Dr. Ralph Wiggin who reluctantly accepted the position in February, 1934, upon the retirement of Dr. Charles T. Howard. Dr. Wiggin will continue as chief of the urological service at the Hospitals.

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University of Maryland School of Medicine

Faculty changes: Dr. James Dawson Reeder, clinical professor of diseases of the colon and rectum, has been promoted to the rank of professor. Dr. John Mason Hundley, Jr., was promoted from associate in gynecology to professor of clinical gynecology. Magnus Gregersen, Ph.D., was appointed professor of physiology.

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University of Louisville School of Medicine

The new addition to the City Hospital is an L-shaped, four-story building in modified Spanish renaissance style of buff colored face brick with limestone trim. The shorter limb of the ell connects with the hospital at every floor and the longer forms a wing similar to the other wings of the hospital. In addition to the new building, the contract calls for remodeling the psychopathic ward, installing an elevator, changing the floor above to house equipment for hydrotherapy and occupational therapy, and enclosing a roof garden for this department. Further, the ground floor in three wings of the hospital proper is being revamped for emergency, traumatic and orthopedic cases. The total appropriation for all this and for equipment amounts to $446,000.

On the ground floor of the new building are lobby and admission office for the dispensaries, record room, social service department, drug store, pediatric and dermatological clinics. The first floor houses a continuation of the record room and the following dispensaries: Ear, Nose, Throat, Eye, Medical, Obstetric and Dental with some space for special clinics. On the second floor are male and female surgical and gynecological dispensaries, operating room, isolation for obstetrical cases and space for special clinics.

The third floor has the pathological and x-ray departments and the urological clinic.

Remodeling Hall number 1 of the hospital proper calls for an emergency operating room, fracture room, orthopedic and venereal clinics, and in Halls numbers 2 and 4 traumatic wards.

The remodeling of the psychopathic wards calls for the installation of an elevator for the spychopathic service, adding to each of the two floors three rooms which include a nurse's office and two observation rooms, the installation of new steel windows in the observation rooms on the first and second floors and on the third floor where there are four new observation rooms. In addition, on the third floor, space has been set aside for Hydrotherapy with six recovery rooms and Occupational Therapy. On the roof is an enclosed space for psychopathic patients.

In all, the building program will add, besides the new dispensaries, some 80 additional beds to the hospital's capacity.

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Western Reserve University School of Medicine

February 10, 1936, Dr. Henry E. Sigerist, Professor of Medical History, The Johns Hopkins University, spoke at an open meeting of the Alpha Omega Alpha Society on "Problems and Methods in Medical History."

The faculty has arranged to follow this by a series of lectures on historical, ethical and sociological aspects of medicine. These lectures will be addressed

especially to students of the first year but the topics selected are of interest to all medical students. They will be given in the Institute of Pathology at 7:00 P. M. on the following dates:

Feb. 17: "Medicine in Ancient Times," Dr. T. Wingate Todd; March 3: "Medicine in the Medieval Period," Dr. Howard T. Karsner; March 17: "Medicine Since the Renaissance," Dr. Harry Goldblatt; April 7: "Medicine in America," Dr. Carl J. Wiggers; April 14: "Progress in the Education of the Physician, with Especial Reference to the United States," Dr. Frederick T. Waite; April 21: "The Physician in Modern Society," Dr. Joseph T. Wearn; April 28: "Medical Ethics: Their Origin and Purpose," Dr. Carl H. Lenhart.

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Indiana University School of Medicine

A new three floor building will be erected in Bloomington as an addition to the Medical School.

The new building, recently authorized by the University Board of Trustees, will be a three story fireproof structure with a small fourth floor extension for housing animals used for experimentation. The main entrance of the building will be situated on the first floor and will face Third street. The section of the "L" shaped structure on East Third street will be 140 feet in length while the section facing Forest place will be 120 feet.

Laboratories in the structure will be arranged logically and the building will alleviate crowded conditions in Owen hall, which will continue to be used, Dean B. D. Myers of the Medical School said Tuesday. The building will be one of the best medical structures in the United States, Dean Myers said. In addition to the laboratories and classrooms for first year medical students, the building will provide for expansion of arts classes in anatomy and physiology.

A unique freezing room will be situated in the basement of the building, according to the plans. In addition there will be a preparation room, a screened service entrance, and general storage room.

First floor plans call for a histology laboratory, a brain storage room and a large student study room as well as the auditorium. The business offices of Dean Myers, his secretary, and Dr. J. A. Badertscher will be situated on the second floor. A large museum for storing models, a library room, a seminar room, and research rooms will complete the second floor.

The third floor will provide laboratory room for 112 students. An elevated lecture room with a turning table in the center for demonstrations will be one of the main features of this floor. The plans also call for an x-ray room, a large locker room and a dissecting room on this floor.

The new building will be constructed of Indiana limestone.

A large amphitheatre with a seating capacity of 180 persons and ample space in the center for a motion picture projector for the showing of the latest developments in the medical world will be provided in the new $471,000 medical building to be erected east of the business administration building on East Third street, according to the plans of the architect, A. M. Strauss.

The auditorium, to be situated near the main entrance of the structure on the first floor, will have excellent facilities for the projection of motion pictures. The room will have no windows and will be lighted artificially.

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University of Alabama School of Medicine

Dr. L. B. Arey, professor of anatomy, and chairman of the division at the Northwestern University Medical School, Chicago, will deliver the Phi Beta Pi lecture March 13. The title of the lecture will be "Wound Healing." The lecture

will be part of the program of the Southern Provincial Assembly of Phi Beta Pi to be held March 13 and 14.

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Eclectic Medical College

The Board of Trustees of the college, at a meeting held January 31, 1936, took the following action:

(a) Resolved that The Eclectic Medical College will not accept a freshman class for matriculation for the 1936-1937 session.

(b) Resolved that The Eclectic Medical College will complete the medical instruction of all students enrolled at the present time and terminate undergraduate instruction at the graduation of the present freshman class in 1939.

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University of Minnesota Medical School

The third annual lecture in the E. Starr Judd Lectureship in Surgery, established at the University of Minnesota by the late Dr. E. Starr Judd, will be given by Dr. Frank C. Mann, Professor of Experimental Surgery in the Mayo Foundation, on the university campus in Minneapolis, March 17, at 8:15 p. m. The subject of Dr. Mann's lecture will be "Hepatic Physiology and Pathology from the Surgical Viewpoint: A Review of Experimental Investigations."

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University of Cincinnati College of Medicine

GIFTS: Research Fund, Internal Medicine, $13,750; Department of Surgery, $5,000; Heart Station, $2,000; Pneumonia Typing, $6,000; Obstetrics, $3,500.

Affiliation of the Shoemaker Clinic, an institution for negroes, with the College of Medicine, was recently announced. The clinic will continue to be financed by the Community Chest, and the college of medicine will assume responsibility for the medical services. Physicians serving in the Shoemaker Clinic will be given a status similar to that of physicians in the outpatient department of the Cincinnati General Hospital.

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University of Oregon Medical School

A gift of $2,000 has been received from the Rockefeller Foundation for research in the department of anatomy. The work will be carried out by William F. Allen, Ph.D., and Olof Larsell, Ph.D., professors of anatomy. It has to do with physiology of the brain, with particular reference to the sense of smell and associated reactions.

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Johns Hopkins University School of Medicine

William Mansfield Clark, Ph.D., professor of physiological chemistry, has been awarded the William H. Nichols Medal of the New York section of the American Chemical Society for 1936.

Dr. Clark received his degree of doctor of philosophy from Johns Hopkins in 1910. He was research chemist with the dairy division of the U. S. Department of Agriculture from 1910 to 1920 and for several years chief of the division of chemistry at the Hygienic Laboratory, U. S. Public Health Service. In 1927 he became DeLamar professor of physiological chemistry at Johns Hopkins University School of Medicine. His work has dealt with metabolism of bacteria, chemistry of milk and cheese, acid-base and oxidation-reduction equilibriums, and determination of hydrogen ions. In 1933 he was president of the Society of American Bacteriologists and the American Society of Biological Chemists.

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University of Rochester School of Medicine

The tenth anniversary of the opening of the school was celebrated with a special program, January 9-10. Ten years

of medical progress was reviewed in seminar sessions, general scientific meetings and demonstrations of research in progress. Dr. Elliott P. Joslin, Boston, delivered the Eastman Memorial Lecture on the evening of January 10, on "Diabetes of Today and Tomorrow."

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University of California Medical School

Dr. Howard C. Naffziger, professor of surgery, delivered the annual Hodgen lecture at the auditorium of the St. Louis Medical Society, January 14, under the auspices of the St. Louis Surgical Society and the Medical Fund Society. Dr. Naffziger discussed "Malignant Exophthalmos, Its Pathology, Treatment and Late Results."

Dr. Alexis Carrel of the Rockefeller Institute for Medical Research, New York, has been appointed Hitchcock professor for the spring semester. The Hitchcock professorship was established by a fund started in 1872 to provide "free lectures on the campus upon scientific and practical subjects but not for the advantage of any religious sect nor upon political subjects."

A room containing historical material has been set aside at the University of California Medical School in honor of the late Dr. Leroy Crummer, Los Angeles, who inaugurated systematic instruction in medical history in the school. The exhibit includes Dr. Crummer's library and donations by physicians. A field medical kit used during the Franco-Prussian war, a set of instruments used by Dr. Beverly Cole, one of the founders of the medical school, and two microscopes dating from the seventeenth century are among the surgical devices shown. The oldest book in the collection is a Gerson of 1472, one of the earliest medical classics. Dr. Crummer, who died in 1934, was clinical professor of medical history and bibliography at the medical school and professor of the history of medicine, University of Southern California School of Medicine.

Dr. John G. FitzGerald, dean of the faculty of medicine and director of the school of hygiene and Connaught Laboratories, University of Toronto, will deliver the annual Morris Hertzstein lectures under the auspices of the medical schools of Stanford University and the University of California. The lectures, which will be given March 2-4, will deal with preventive medicine.

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University of Chicago Division of Biological Sciences

Dr. Eugene M. Karl Geiling, associate professor of pharmacology and experimental therapeutics, Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of pharmacology and head of a newly created department of pharmacology. Pharmacology was formerly included in the department of physiologic chemistry and pharmacology. Under the new arrangement it becomes a separate department, and the older department, of which Prof. Fred C. Koch is chairman, has been renamed the department of biochemistry.

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Ohio State University

Announcement is made of the Elizabeth Clay Howald Scholarship of $3,000 for study. Any person who has in progress work that promises to yield important contributions to knowledge is eligible for the scholarship. If the appointee has ever been a student at Ohio State University or a member of its staff he may carry on his investigations either at the university or in another place where superior advantages for his field are available. If he has had no connection with the university, he must do his work there. Applications must be filed with the dean of the graduate school not later than March 1. Blanks may be obtained from the dean. The appointment will be made

April 1 and the term of appointment will begin July 1. The honorarium will be paid in twelve monthly installments.

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University of North Carolina School of Medicine

Dr. Milton J. Rosenau, for many years Charles Wilder professor of preventive medicine and hygiene at Harvard Medical School and in the Harvard School of Public Health, Boston, has been appointed director of a new division of public health. The new division, which began operation January 15, is conducted in cooperation with the state board of health, members of whose executive staff will form part of the teaching staff. Dr. Rosenau retired from Harvard in 1935.

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University of Vermont Medical College

The medical library and surgical instruments of Dr. Isadore C. Eisenberg, New York, who died March 23, 1935, has been given to the medical school.

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University of Oklahoma School of Medicine

APPOINTMENTS: Dr. Louis Alvin Turley, professor of pathology, assistant dean; Dr. Egil T. Olsen, medical director and assistant superintendent of the University and Adjunct Hospitals; Dr. Millington Smith, professor emeritus of gynecology (deceased, January 9, 1936); Dr. Harold A. Shoemaker, professor of pharmacology; Dr. Leo J. Starry, professor of clinical surgery; Dr. Grider Penick, associate professor of gynecology; Miss Beatrice Edwards, research associate in biochemistry; Mr. Harold M. Hefley, research associate in bacteriology; Miss Gertrude H. Wilber, research associate in histology; Dr. Wayne Hull, Director of the Outpatient Department and resident pathologist; Dr. Bert F. Keltz, supervisor of clinical clerkships; Dr. Phillip M. McNeill, associate professor of medicine, head of the division of physical diagnosis.

RESEARCH FELLOWSHIPS: Three research fellowships in the medical sciences are available at the school through a fund provided by the legislature. Two will carry stipends of $1,200 each and the other a stipend of $1,500. Special equipment and supplies will be furnished. Applicants must furnish certified data showing their qualifications as research workers, the problems they wish to pursue and estimates of the cost of apparatus and supplies needed. Each applicant must also furnish the names of three persons well known in the field of medical education with whom the university may communicate. Any one wishing to obtain one of these fellowships should apply to the dean, Dr. Robert U. Patterson, 801 East Thirteenth Street, Oklahoma City.

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Jefferson Medical College

The William Potter Memorial Lecture was delivered by Dean Lewis, M. D., Sc. D., LL. D., Professor of Surgery, Johns Hopkins University School of Medicine, on February 7, 1936. His subject was "Epochs in the Development of Surgery."

The Alpha Omega Alpha Lecture was delivered by Dr. Walter Bradford Cannon, George Higginson Professor of Physiology, Harvard University Medical School, February 14, 1936, on "Serendipity."

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Duke University School of Medicine

January 23, Dr. C. F. Strosnider, President of the North Carolina Medical Society, talked to the faculty and students on "Organized Medicine and Medical Ethics."

January 30 and 31, Dr. Alfred Blalock, Associate Professor of Surgery, Vanderbilt University School of Medicine, lectured on "Shock and Lymphatic Obstruction," respectively.

University of Nebraska College of Medicine

The college is making a collection of old surgical instruments and appliances of physicians who have practised in Nebraska for many years. The collection of the late Dr. John E. Summers has found a place in an annex to the library of the College of Medicine. Several other physicians have added instruments of value to the collection.

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University of Kansas School of Medicine

The PWA has approved the construction of four buildings in conection with Bell Memorial Hospital, Kansas City, which is the teaching hospital unit of the School of Medicine. These projects total $291,000. Part of this amount is from donors and sources other than the Federal Government.

The buildings include the Children's Building—a modern children's hospital; the Hixon Laboratory for Medical Research; the Clinic Building, to care for free patients, which will replace the present wooden structure; and a warehouse and garage.

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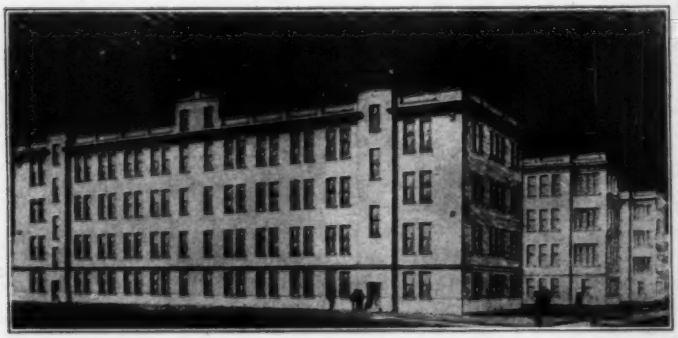
New York Medical College

The New York Homeopathic Medical College announces that the name of the college has been changed to New York Medical College.



LOUISVILLE CITY HOSPITAL NEW DISPENSARY BUILDING
TEACHING HOSPITAL OF THE UNIVERSITY OF LOUISVILLE SCHOOL OF MEDICINE.

General News

University of Illinois Foundation

The University of Illinois Foundation is an organization incorporated not for profit but for the purpose of assisting the University in obtaining gifts of money for specific buildings, collections of valuable works of art, rare books, museum collections, scholarships, etc. The University of Illinois is one of the great educational centers of the nation and has as its primary function the systematic instruction of the youth of Illinois and other states in all branches of knowledge. The proper environment must be created, cultural influence emphasized, the wholesome development of the body encouraged, mental stimuli provided outside of the regular curricula, and a host of other influences maintained for absorption by the young people who use the campus during a four-year period. This new Foundation hopes to help build up some of the social and esthetic influences.

Objects of the Foundation are:

(1) To assist in developing and increasing the facilities of the University of Illinois for broader educational opportunities for, and service to, its students and alumni and to the citizens of the State of Illinois.

(2) To receive, hold and administer such gifts with the primary object of serving purposes other than those for which the State of Illinois ordinarily makes sufficient appropriations.

(3) To act as the business agent of the University Board of Trustees.

(4) To do such other acts and undertake such other enterprises as in the judgment of the Board of Directors shall tend to promote the interests and welfare of the University of Illinois.

The organization of the new Foundation was completed by the acceptance by the University Board of Trustees of the form of the organization in February of last year, the provision for its maintenance in the budget of the University, the incorporation of the Foundation under the laws of the State of Illinois and the election of a board of directors by the Executive Committee of the Alumni Association at a meeting in July.

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Harrison Memorial Fund

The Orphans' Court has recently handed down a ruling giving to the University of Pennsylvania immediate control of a bequest amounting to about $2,000,000 from the estate of the late George Leib Harrison, retired chemical manufacturer, who died in March, 1935. The money will be used to endow the "George L. and Emily McMichael Harrison Memorial Fund for General Surgical Research." The bequest is subject to four annuities.

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Gannett Foundation

Frank E. Gannett recently announced the formation of a foundation to distribute 75 per cent of the net income of his newspapers, after his death, "for public charitable, educational and general philanthropic purposes." The donor said that the two considerations that actuated him in setting up the Frank E. Gannett Newspaper Foundation, Inc., were: (1) Continuation of his nineteen publications in fourteen cities with the primary idea of making good and useful newspapers of widest possible service to their communities, rather than the largest possible profit. (2) That most of the profits, after the first consideration is satisfied, shall go for the welfare of the

people, particularly in the area they serve, and not to pile fortunes for any individual or group. The Foundation will become the controlling owner of the common stock now owned in entirety by Mr. Gannett.

The Foundation provides the "greatest latitude" to a board of directors in distributing its funds. Eleven directors, to serve for life or until resignations, were announced. Vacancies on the board are to be filled by the board itself from persons qualifying with at least 100 shares of stock. At least eight must be experienced newspaper men and one a lawyer.

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Bross Foundation Prize

A cash prize of $15,000 will be awarded by the trustees of Lake Forest College on or after January 1, 1940, for the best book or manuscript, heretofore unpublished, on the connection, relation and mutual bearing of the humanities, the social sciences, the physical sciences, the biological sciences, or any branch of knowledge, with and upon the Christian religion. The award will be made under the Bross Foundation, founded by William Bross in 1890. For further information, address President Herbert M. Moore, Lake Forest College.

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University of Michigan

September 10, 1935, the University was the recipient of a gift of $5,000,000 from the Horace H. and Mary A. Rackham fund for the enlargement of its graduate school. Of this sum $1,000,000 will be spent for land adjoining the present campus and for offices of the graduate school, classrooms, an auditorium, and offices for the administration of the fund. The remainder will be used as an endowment, the income from which is to be used to supplement the funds of the University already used for the graduate school. This income will permit the expansion of its research faculty and the accomplishment of many original researches heretofore impossible because of lack of funds.

Mr. Rackham was always interested in the University of Michigan and during his life had given over $400,000 for archæological research, student loans, and other objects.

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Commonwealth Fund

More than two thirds of $1,574,025.07 appropriated by the Commonwealth Fund for the year ended Sept. 30, 1935, was devoted to the promotion of health and medical service, according to the annual report. After several years of intensive development of rural health service in Tennessee, Massachusetts and Mississippi, and isolated activities of a similar sort in Oregon, North Dakota, Georgia, Maine, Kentucky and New Mexico, the conclusion has been reached that to enlarge the size and improve the standards of rural health departments beyond the point which they have generally reached is practicable. The fund believes a rural health department "should be organized on a countywide basis."

About 14 per cent of the fund's gifts were in the field of mental hygiene, in this country primarily for the promotion of training for psychiatry and psychiatric social work. At three teaching hospitals provision was made for the addition of psychiatric or psychologic service to children's clinics as a step toward more accurate diagnosis and better treatment of common disorders which arise from emotional as well as physical causes.

During the year a new general community hospital, the seventh in this group, was opened at Kingsport, Tenn., under the plan by which the fund finances the greater part of the building and equipment costs and the community agrees to maintain a standard hospital, serving patients regardless of status, and doing a certain amount of free work. Plans are

now being drawn for another such hospital at Tupelo, Miss., where a local quota of $40,000 has already been raised, and it is expected that the fund will shortly announce the selection of the ninth community to which such aid will be given. In addition, the fund aided medical research and awarded fellowships to worthy students.

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Medical Plan for Oxford Undergraduates

Medical provident schemes have become common in recent years. The Oxford University Provident Association was inaugurated in 1932 for the reasons that the position of the Oxford undergraduates with regard to sickness or accident was extremely unsatisfactory, that, for economic reasons, medical attention was not sought until serious and avoidable complications had arisen, and that physicians were handicapped in obtaining proper nursing and investigations, owing to the financial anxieties of their patients. Now for members of the association the position is entirely changed. They do not hesitate to seek help at the time when it is most important that they should obtain expert advice and care. The experience of three years has shown that a premium of $15 a year is sufficient to secure such substantial benefits, among others, as $30 a week for a period up to four weeks toward the cost of maintenance in a nursing home, a contribution not exceeding $100 toward the cost of a surgical operation, and half the fees of general practitioners subject to a maximum of $40 per annum. These benefits are payable for sickness and accident in any part of the world and are not restricted to the period of residence at Oxford. There are nearly 1,500 members of the association, and, during the year ended July 1935, 724 claims affecting 534 members, amounting to $17,300 were dealt with.—*J.A.M.A.*, Lond. Letter, Jan. 11, 1936.

Psychiatric Residencies

The Worcester State Hospital, Worcester, announces six psychiatric residencies of twelve months to begin July 1. The service will be rotating in medical and surgical wards and in male and female psychiatric wards. The hospital provides maintenance. Graduates, unmarried, of class A medical schools who have completed accredited internships in medicine are eligible. Registration should be made by March 1 and the examination will be held at the hospital, March 15. Applications should be sent to the director of clinical psychiatry.

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Medical Corps U. S. Navy

An examination of candidates for appointment in the medical corps of the U. S. Navy will be held at the Naval Medical School, Washington, D. C., and the Naval Hospital, Mare Island, San Francisco, beginning May 18. Applicants must be graduates of schools listed as class A by the Council on Medical Education and Hospitals of the American Medical Association, must be citizens of the United States, and must have served at least one year's rotating internship in a civilian hospital. Candidates must be between the ages of 21 and 32. For further information and application blanks, address the Surgeon General of the U. S. Navy, Navy Department, Washington, D. C.

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Medical Students and Nursing

During the past three semesters at the University of Freiburg more than 150 medical students (male and female) during the vacations and, to a certain extent, also during the semester have entered the Freiburg university clinics and the Baden health centers and nursing homes to serve as nurses or caretakers of the sick. The "Medizinischer Lehrdienst" at the University of Freiburg is an outgrowth of this recent practice. Students who begin

their study of medicine at the opening of the winter semester 1935-1936 and who enter this lehrdienst will serve as nurses throughout their first semester. In order that this service may not lengthen their stay at the university, the students who take part in the Medizinischer Lehrdienst remain matriculated at the university. Their work at the university is specially arranged so that they can take their preliminary tests at the regular appointed times. The student-nurses reside in a dormitory under the direction of an older medical student. In the clinics in which they serve, the student-nurses receive free maintenance, which reduces the living expenses of the individual student to a comparatively low level.

The Medizinischer Lehrdienst has come to be regarded as an essential factor in the training of a physician. It is planned to serve at the same time as a means of selecting the most promising students to continue their medical studies, as it is thought that, through observation of students' application in the clinics, unsuitable students can be eliminated during their first semester's study.—*J.A.M.A.*, Berlin Letter, Jan. 25, 1936.

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Brain Surgery in Alaska 2,000 Years Ago

A specimen of this ancient surgery, the first unearthed in Alaska, is the discovery announced by Dr. Ales Hrdlicka of the Smithsonian Institution. While digging on Kodiak Island, he found the skull of a man who had a cavity about two inches long and half an inch wide scraped in his skull down to a thin film of bone left over the brain. The wound healed perfectly.

It is known that trephining was done in Europe 10,000 years ago, and was skillfully done by Indians of Peru and some other parts of America, but it is not known whether the intention was to relieve brain pressure or merely to let out evil spirits.

The fact that the operation was practised in Alaska indicates strongly, Doctor Hrdlicka said, that the operation was brought to America from Asia by some early waves of immigrants who crossed Bering Strait.—*The Diplomate*, January, 1936.

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Conference on Psychiatric Education

The division of psychiatric education of the National Committee for Mental Hygiene is sponsoring a conference at the Henry Phipps Psychiatric Clinic, Baltimore, April 8-10, on the content and methods of instruction in psychiatry. Dr. Adolf Meyer, Baltimore, will be in charge of the conference, to which all physicians engaged in the teaching of psychiatry are invited. Clinics and demonstrations will be a part of the program.

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Grant for Medicine and Public Health Cut 70 Per Cent

Financial support in the whole field of science by the large foundations has been cut to less than one fourth of what was spent for this purpose during 1930, it is revealed by a survey of the Twentieth Century Fund made public in December.

Funds for research in the physical and biological sciences dropped $6,000,000. Appropriations from the sixty-eight foundations surveyed amounted to $7,774,999 in 1930. In 1934, the figure had dropped to only $1,746,662.

Funds for medicine and public health were cut from $28,841,937, granted in 1930, to but $8,609,710 for 1934, a loss of 70 per cent.

On the average, grants for all purposes were cut 53 per cent—from $68,225,411 to $32,063,619. This means a drop in funds for education and research in various fields of more than $36,000,000. —*The Diplomate*, January, 1936.

Abstracts of Current Literature

The Recent Graduate and Drug Nihilism

Today among many practitioners, and especially those who have recently graduated, there is a growing tendency to ignore the established principles of drug therapy and to minimize the value of standard remedies in modern practice. Judging from the restricted use now made of pharmacopeial preparations, it would appear that a wave of drug nihilism is sweeping over the profession and engulfing many members. It seems that these individuals, appropriately called "nihilists," employ few reliable drugs, show but little skill in selecting those they do use, and usually prescribe insufficient quantities to permit adequate treatment. Either they are unwilling or, what is more likely, they do not know how to use more than a limited number of the very simplest preparations.

Unfortunately, their practice of nihilism does not apply to the proprietary drugs, good or bad, which are given with little hesitancy. These compounds can be prescribed quickly by simply jotting down some easily remembered trade-name. For the "nihilist" to devote a minute or two to writing a suitable prescription seems to be impracticable, since he believes it matters little what medication is given anyway. Usually the "nihilist" tries to avoid writing a prescription. Should the patient suggest that some remedy be prescribed, the doctor readily complies by giving the first preparation he thinks of —unless this effort can be saved by merely handing the patient a sample bottle of some new proprietary. With this type of physician in our midst, is it surprising that drug therapy and prescription writing are rapidly becoming lost arts?

For some time the pharmacists have been aware that very few pharmacopeial preparations are being prescribed. While, now and then, they make feeble attempts to heed the suggestions offered by trade journals to improve the turnover of standard drugs, their main interest is in the more profitable proprietaries. These fast-selling compounds now occupy the conspicuous and handier places on the shelves, while the galenicals have been relegated to the back rooms and basement. Few pharmacies can be found today which are exclusively devoted to the compounding of prescriptions, and none without an abundance of proprietary remedies.

The pharmacist's prescription file also contains interesting information. A search through the current prescriptions written by both the older and the younger practitioners will show that the younger man, who often is the busier, rarely writes an order for drugs, and when he does he invariably calls for proprietaries. This was shown to be true some years ago and is even more evident today. In 1930 Dr. Walter Cree examined the prescription files of several drug stores in Detroit and found that 54 per cent called for pharmacopeial drugs, 17 per cent for a mixture of standard remedies and proprietaries, and 29 per cent for proprietary remedies alone. He noted that prescriptions in the first group were written mainly by older physicians and those in the last two groups almost entirely by the more recent graduates. Commenting on these observations, Dr. Cree aptly remarks that "the younger physician has drifted into the habit of using proprietary preparations to save time or has been guided by ostentatious advertising." Dr. Cree's contention is supported by the statements of several other writers, who have similarly called attention to the recent graduate's shortcomings in drug ther-

apy as well as the increased use of proprietaries in the profession.

A justifiable nihilism developed in modern times through the influence of Osler (1849-1919), who neglected therapeutics to emphasize diagnosis. This nihilism was helpful in discarding many useless polypharmacal preparations and in focusing attention on the experimental evidence for the action of pure chemicals. Other than hearsay there are little data to show to what extent nihilism is now practiced. Since few physicians take up the practice of nihilism intentionally but seem rather to have fallen into this habit through inability to employ drugs with success, perhaps the true reason for their nihilism can be traced to inadequate knowledge of drug therapy. This leads to a consideration of the results shown by state medical examining boards. If the graduates of today show little interest in drug therapy and appear to be doing poorly in the subjects of pharmacology, materia medica and therapeutics, it can hardly be expected that in their practice they will experience much success with the use of drugs. Those who are fortunate in having large practices will resort to the use of makeshift proprietaries, and those with few patients will soon forget what little they know of drug therapy and prescription writing. It appears, therefore, that much can be learned concerning not only the extent of nihilism but also its present increase, if some reliable information as to the recent graduate's knowledge of drug therapy is at hand.

A logical source for such information was suggested by a circular letter sent to the deans of various medical schools in August 1934 by Dr. Felix J. Underwood, executive officer of the Mississippi State Board of Health. In this letter the following significant statement was made:

"For several years the grades in materia medica and pharmacology have been uniformly low. Because of the particularly low grades made this year in this subject, it was recommended by the examiner in that subject that all medical schools whose graduates are eligible for examination by this board be notified of the findings of the board and requested to make efforts to improve or increase teaching on this subject. This is particularly necessary now when there is so much medical nihilism."

In January 1935, questionnaires were sent to all secretaries of state medical examining boards in this country asking their opinions of the knowledge and training recent graduates had in pharmacology, materia medica and therapeutics.

Practically every state secretary answered and voiced some opinion about the teaching of pharmacology, although suitable statistics could be secured from only twenty states. While nine state secretaries reported that they could find no fault with respect to this subject, a larger number registered complaints that the graduates of today know little about drugs and less about their use. Some of the answers received show that all is not well with respect to the younger physician's knowledge of therapeutics.

Twenty states supplied examination averages for one or more years during the period 1930 to 1935.

It appears that few states take the trouble to compile subject averages or arrange their examination results in a satisfactory statistical manner. Some states omit examinations in certain major subjects and that only a few conduct separate examinations in the subjects of pediatrics, medical jurisprudence, and the specialties such as ear, eye, nose and throat, and urology. In some states, such as Connecticut and Minnesota, examination in the fundamental subjects comprising the first two years of the medical curriculum are conducted by basic science boards, which examine the student when he has completed this much work. More than 6,000 examinees are reported. The general average made in the fifteen ma-

jor subjects listed was 82.8 per cent. The general average of 81.2 per cent for pharmacology, materia medica and therapeutics is the third lowest given, the lowest average being made in anatomy and histology and the next lowest in chemistry and biochemistry. Four other subjects were below average, while those which were above do not appear very much higher than the general average for all subjects. It is interesting to note, in view of recent widespread criticism of our present-day knowledge and practice of obstetrics, that in this survey this subject showed, next to pediatrics, the highest average—suggesting that our graduates are well versed in theory if not in practice.

An inspection of the results given for individual states shows that Minnesota reported the highest general average of 88.9 per cent and Nevada, with only few examinees, the lowest of 77.6 per cent. The lowest figure given for any subject is 69 per cent, which was the average for pharmacology and also biochemistry in New Jersey and for biochemistry in Nevada. When the subject averages of each state are compared, it will be seen that the results shown for pharmacology are the lowest of all the states of Kentucky, Montana and North Dakota and as low as or higher than only one other subject in New Jersey, Mississippi, Oklahoma, Minnesota and Idaho. While similar observations may be made, perhaps, for the two other low subjects, it is apparent that pharmacology deserves its place as thirteenth on the list of subjects reported here.

Sets of questions on pharmacology, materia medica and therapeutics for examination held during the period reported on were obtained from most of these states. A study of these questions shows that while some variation exists, of course, none are especially difficult. The majority are of the general type that should be easily answered, provided the student has a fair knowledge of the subject.

The purpose of this brief survey has been to present definite evidence to the medical profession that our recent graduates know little about the use of drugs when they begin the practice of medicine. The statistics serve to substantiate the current rumors frequently heard about the shortcomings of our younger physicians. While considerations for improving this serious situation are the immediate concern of the teaching profession, a plea is made to the practicing physician to endeavor to do what he can to keep out of the ranks of nihilism and improve his own selection and utilization of drugs. The practitioner can accomplish this by giving more attention to discussions on desirable drug therapy and proved newly introduced remedies that appear regularly in ethical medical journals, and less to the self-praising advertisements that fill uncritical medical publications. To his surprise, the physician will often find that, if he reviews standard textbooks on drugs and therapeutics, much worth while information is offered, a great deal of which may have been previously overlooked. As for prescriptions, it matters little whether they are written in metric or apothecary systems, if the drugs prescribed can be depended on to do what is desired of them.—NORMAN A. DAVID: *J.A.M.A.*, Feb. 1, 1936, p. 405.

Book News

A. B. C. of the Endocrines

By Jenny Gregory, Boston. Williams & Wilkins Company, Baltimore, 1935. Price, $3.

This work is not original in the sense of reporting new and original research and makes no pretense of contributing to scientific knowledge of the endocrine glands although it does contain recent information that has not yet found its way into the more elementary books on the subject. Its originality lies in the manner of presenting these facts. The story of each gland and its relationship to the others is told in a series of charts and graphs. Within each chapter the charts are arranged from the simpler and best known to the more complex and technical. Considerable critical caution has been exercised in selecting for presentation only those facts that have been thoroughly verified and that are up to date. To the ten chapters is added a very fine glossary of technical terms and a carefully selected bibliography.

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Handbook of Bacteriology

By Joseph W. Bigger, M.D., Professor of Bacteriology and Preventive Medicine, University of Dublin, Ireland. 4th Ed. William Wood & Company, Baltimore. 1935. Price $4.25.

A small, compact work, admirably suited for medical students, presenting all the more important facts relating to bacteria as they affect man. The name by which each organism is commonly known is given in heavy type; alternative names are printed in italics. Theories are dealt with briefly; historical data are omitted to keep down the size of the book, which will be appreciated by medical students.

Essentials of Psychopathology

By George W. Henry, Associate Professor of Psychiatry, Cornell University Medical School. William Wood & Company, Baltimore. 1935. Price, $4.

This is a clear, concise presentation of the nature and causes of personality disorders, with methods of examination, intended primarily for medical students. A valuable and up-to-date book in a field of rapidly increasing interest and importance.

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Demonstrations of Physical Signs in Clinical Surgery

By Hamilton Bailey, F.R.C.S. (eng.), 5th Ed. William Wood & Company, Baltimore, 1935. Price, $6.50.

This work contains all the essential elements for a good course in surgical diagnosis, or, rather, clinical diagnosis, with which every medical student should be thoroughly familiar. It is concise, but complete in every detail, and well illustrated by nearly four hundred photographs and diagrams. The teaching in surgery to undergraduates might well be limited to the field covered by this book.

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New Pathways for Children With Cerebral Palsy

By Gladys Gage Roberts and Leah C. Thomas, respectively Directors of Robin Hood's Barn and Director of Therapeutics at Robin Hood's Barn, Ascutney, Vermont. The Macmillan Company, New York. 1935. Price, $2.50.

The description of the subtle instruction, mostly under the guise of games and play that goes on at "Robin Hood's Barn" reads like a novel. The world is adapted to the child. The fear complex is banished and relaxation becomes possible. Eagerness and happiness replace

lethargy and discouragement. The book is packed with practicality. Through its pages flows an optimism justified by accomplishment. The authors have attacked an age old problem by a new combination of conventional methods and apparently have reached a solution not attained by previous workers in this field. The book should prove a stimulus to renewed effort to help these children.

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Diseases of Women

By Harry S. Crossen, M.D., Professor Emeritus of Clinical Gynecology, and Robert J. Crossen, M.D., Instructor in Clinical Gynecology and Obstetrics, Washington University School of Medicine. 8th Ed. The C. V. Mosby Company, St. Louis. 1935. Price, $10.

This book presents the gynecologic knowledge of today arranged systematically for teaching purposes. The subjects are taken up in the general order in which gynecology is presented to the medical students. The more than one thousand illustrations add to the value of the book. It is one of the most widely used textbooks on the subject, therefore it must be a good book.

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Obstetrical Practice

By Alfred C. Beck, M.D., Professor of Obstetrics and Gynecology, Long Island College of Medicine. The Williams and Wilkins Company, Baltimore. 1935. Price, $7.

This is rather a large book, but its size is occasioned by the extraordinarily large number of illustrations, 1,000, mostly original drawings, which illuminate the text beyond all possibilities of misunderstanding and make the book a veritable atlas as well as a textbook. The text is concise, terse, yet complete.

There are no superfluous sections or chapters and all divisions of the subject are adequately dealt with without skimping or padding. Especial attention has been given to the details of prenatal care and to the mechanism of labor. Specific and unmistakable instructions are given for the care of the toxic patient. A large part of the text deals with the important subject of the effect of pregnancy on the more common medical and surgical diseases. Details of obstetric operations are illustrated to show each procedure step by step.

The arrangement and mechanical work is highly commendable. The free use of side-heads makes ready reference a comparatively simple matter. The large list of references appended to each chapter should meet with approval.

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Fundamentals of Biochemistry in Relation to Human Physiology

By T. R. Parsons, Sidney Sussex College, Cambridge. 5th Ed. William Wood & Company, Baltimore. 1935. Price, $3.

This book presents in a continuous story the more important generally accepted principles which have been derived from the study of the chemical changes occuring in the human body. Although small in size, the bibliography appended to each chapter makes it possible to go deeper into the subject than is necessary for a teaching manual to do. It is a good book for the medical student.

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Regional Anatomy; Adapted to Dissection

By J. C. Hayner, M.D., Associate Professor of Anatomy, New York Homeopathic Medical College. William Wood & Company, Baltimore. 1935. Price, $6.

This is a concise, descriptive regional anatomy, entirely without illustrations. The arrangement of the various regions is determined in accordance with the dissection system generally used. The B. N. A. is used.

Immunology

By Noble P. Sherwood, Ph.D., M.D., Professor of Bacteriology, University of Kansas School of Medicine. The C. V. Mosby Company, St. Louis. 1935. Price, $6.

This book is written for medical students. The author has attempted to lead the student to correlate some of the teachings of physiology, pharmacology, organic, biological and physical chemistry as well as anatomy, pathology and general biology and apply these teachings to the elucidation of the mysteries surrounding infection, resistance, and diagnostic procedures. He attempts to show that clinical, experimental and preventive medicine contribute a great deal to our knowledge of the subject. Definitions are given quite freely. Standard technics are presented, analyzed and discussed. A most complete and useful book.